



SERVICE MANUAL

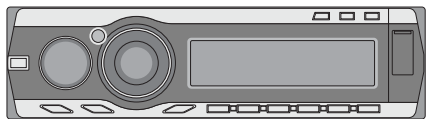
MODEL : LAC6700R

# CAR CD/MP3/WMA RECEIVER SERVICE MANUAL

**MODEL : LAC6700R**

**CAUTION**

BEFORE SERVICING THE UNIT, READ THE "SAFETY PRECAUTIONS"  
IN THIS MANUAL.



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# SECTION 1 SUMMARY

## SERVICING PRECAUTIONS

### 1. Always disconnect the power source before:

- 1) Removing or reinstalling any component, circuit board, module or any other instrument assembly.
- 2) Disconnecting or reconnecting any instrument electrical plug or other electrical connection.
- 3) Connecting a test substitute in parallel with an electrolytic capacitor in the instrument.

**CAUTION:** A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

### 2. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.

### 3. Do not apply power to this instrument and or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

### 4. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

- 1) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.
- 2) The Components used in the unit have a specified conflammability and dielectric strength. When replacing any components, use components which have the same ratings. Components marked in the circuit diagram are important for safety or for the characteristics of the unit. Always replace with the exact components.
- 3) An insulation tube or tape is sometimes used and some components are raised above the printed writing board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install them as they were.
- 4) After servicing always check that the removed screws, components and wiring have been installed correctly and that the portion around the service part has not been damaged. Further check the insulation between the blades of attachment plug and accessible conductive parts.

# ESD PRECAUTIONS

## Electrostatically Sensitive Devices (ESD)



Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called electrostatically sensitive devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ESD devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.
6. Do not remove a replacement ESD device from its protective package until immediately before you are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).
7. Immediately before removing the protective material from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

**CAUTION : BE SURE NO POWER IS APPLIED TO THE CHASSIS OR CIRCUIT, AND OBSERVE ALL OTHER SAFETY PRECAUTIONS.**

8. Minimize bodily motions when handling unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

## CAUTION. GRAPHIC SYMBOLS

	THE LIGHTNING FLASH WITH ARROWHEAD SYMBOL, WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.
	THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.



# SPECIFICATIONS

## • GENERAL

Output Power	50W x 4CH (Max.)
Power Source	DC 12V
Speaker impedance	4Ω
Ground System	Negative
Dimensions (W x H x D)	180 x 51 x 171mm (Without Control Panel)
Net Weight	2.0kg

## • CD SECTION

Frequency Response	20Hz ~ 20kHz
S/N Ratio	85dB
Distortion	0.05%
Channel Separation (1kHz)	60dB

## • RADIO SECTION

### FM

Frequency Range	65 ~ 74, 87.5 ~ 107.9 or 87.5 ~ 108MHz
S/N Ratio	53dB
Distortion	0.7%
Usable Sensitivity	12dBμV

### AM (MW)

Frequency Range	520 ~ 1720 or 522 ~ 1620kHz
S/N Ratio	45dB
Distortion	1.0%
Usable Sensitivity	28dBμV

## • USB SECTION

Version	USB 1.1
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# SECTION 2 ELECTRICAL

## ELECTRICAL TROUBLESHOOTING GUIDE & WAVEFORMS

### 1. MAIN, FRONT & TUNER PART

No	Symptom	Check Point	Location No.
<b>SYSTEM CONTROL</b>			
1	No Power	Checked the Fuse.	CN801
		Checked the Back up Vdd, Gnd.	CN801(16, 15)
		Checked the Micom Back Up Vdd.	IC301(14),D307, IC401(30,47,50,99,100)
		Checked the Micom Ground.	IC401(20,51,97,98)
		Checked the Reset.	IC402, IC401(90)
		Checked the X-tal.	X401, X402
		Checked the ACC in.	Q301,Q302, IC401(38), CN801(14)
		Checked the detachable switch.	SW401, IC401(73)
		Checked the flipdown Detector.	CN901(19), IC401(74)
		Checked the Key line.	IC401(52,53)
2	Not available Remocon	Checked the Remocon Sens Vdd.	CN901(14),Q316,Q317,D307
		Checked the Remocon Sens line.	RM901, IC401(5)
3	Not available to Volume control	Checked the Encoder Volume.	SW901, IC401(40,41)
4	Not available to Key Control	Checked Tact switch.	SW902 ~ SW918
		Checked Key line.	IC410(52,53)
5	No sound  * Power IC : Refer to next page	Checked the E-VR Vdd.	IC301(10),IC601(24)
		Checked the E-VR Ground.	IC601(15)
		Checked the E-VR control.	IC601(22,23), IC401(1,2)
		Checked the E-VR Signal in/out.	IC601(5,6,7,8,9,10,11,13) IC601(17,18,19,20)
		Checked the E-VR Mute Control	IC601(21), IC401(6)
		Checked the Power IC Vdd.	IC801(6, 20)
		Checked the Power IC Ground.	IC801(1, 2, 8, 13, 18, 24)
		Checked the Power IC Control.	IC801(4, 22), IC401(3,10)
		Checked the Power IC Signal in/out.	IC801(11,12, 14, 15) IC801(3,5,7,9,17,19,21,23)
		Checked the Power IC Mute.	IC801(22)
		Checked the Power IC Standby.	IC801(4)
		Checked the Power IC Ripple.	IC801(10)
		Checked the Main Connector.	CN801(1,2, 3, 4, 8, 9, 12, 13)
		Checked the E-VR Vdd.	IC301(10),IC601(24)
		Checked the E-VR Ground.	IC601(15)
6	No Line out signal	Checked the E-VR control.	IC601(22,23), IC401(1,2)
		Checked the E-VR Signal in/out.	IC601(5,6,7,8,9,10,11,13) IC601(17,18,19,20)
		Checked the OPAMP Vdd.	IC701(8),IC702(8)
		Checked the OPAMP Ground.	IC701(4),IC702(4)
		Checked the OPAMP Signal in/out	IC701(3,5,7,1) IC702(3,5,7,1)
		Checked the Line out Mute circuit	Q705,IC401(48)
		Check the Line out Jack	CN703
		Checked the Mute Control.	IC601(21), IC801(4, 22), IC401(3,6,10)
		Checked the AF Mute.	TU101(19), IC401(4)
		Checked the telephone Mute Control.	CN801(5), Q305,Q306, IC401(62)
9	Not available to Telephone Mute	Checked the Mute Control.	IC601(21), IC801(4, 22), IC401(3,6,10)
10	Not available to ANT(Motor Type)	Control Checked the ANT Control.	IC301(12,13),IC401(87)
11	Not available to Remote (External AMP)	Checked the Remote control.	CN801(6), IC402(1,2,4),Q308,Q309 IC401(63,64)
12	No output Beep sound.	Checked the Beep Control.	IC401(80), BU301

## ■ CAUTION - Tip for repair

**Before exchange power amp IC(TB2904) for no audio problem, you have to check below list.**

1. Check VCC (pin 20, 6) & GND
2. Check input pin 11, 12, 14, 15
3. Check Standby, pin 4  
: Follow the below list.
4. Check Mute function, pin 22  
: Follow the below list.

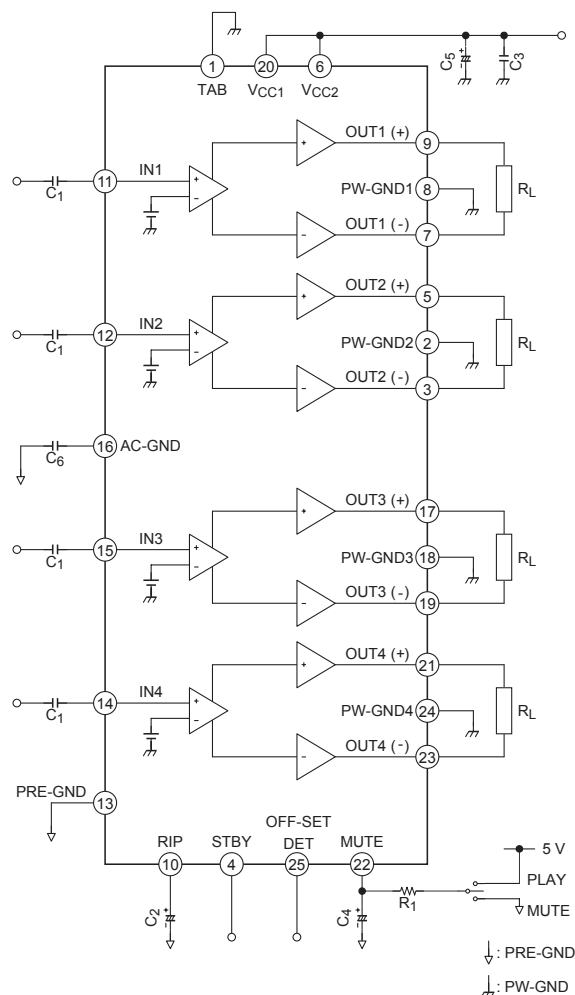
Stand-by	Power	Sound	Voltage
ON	OFF	OFF	0 to 1.5
OFF	ON	ON	3.5 to 6V

5. Check Ripple pin 10.  
: Normally it is high (about 10V)

Mute	Sound	Voltage
ON	OFF	0 to 1.5
OFF	ON	3.5 to 6V

6. Re-soldering all the pin of IC.  
: Prevent crack of solder line.

\* Keep changed IC, We request that you send it to HQ.

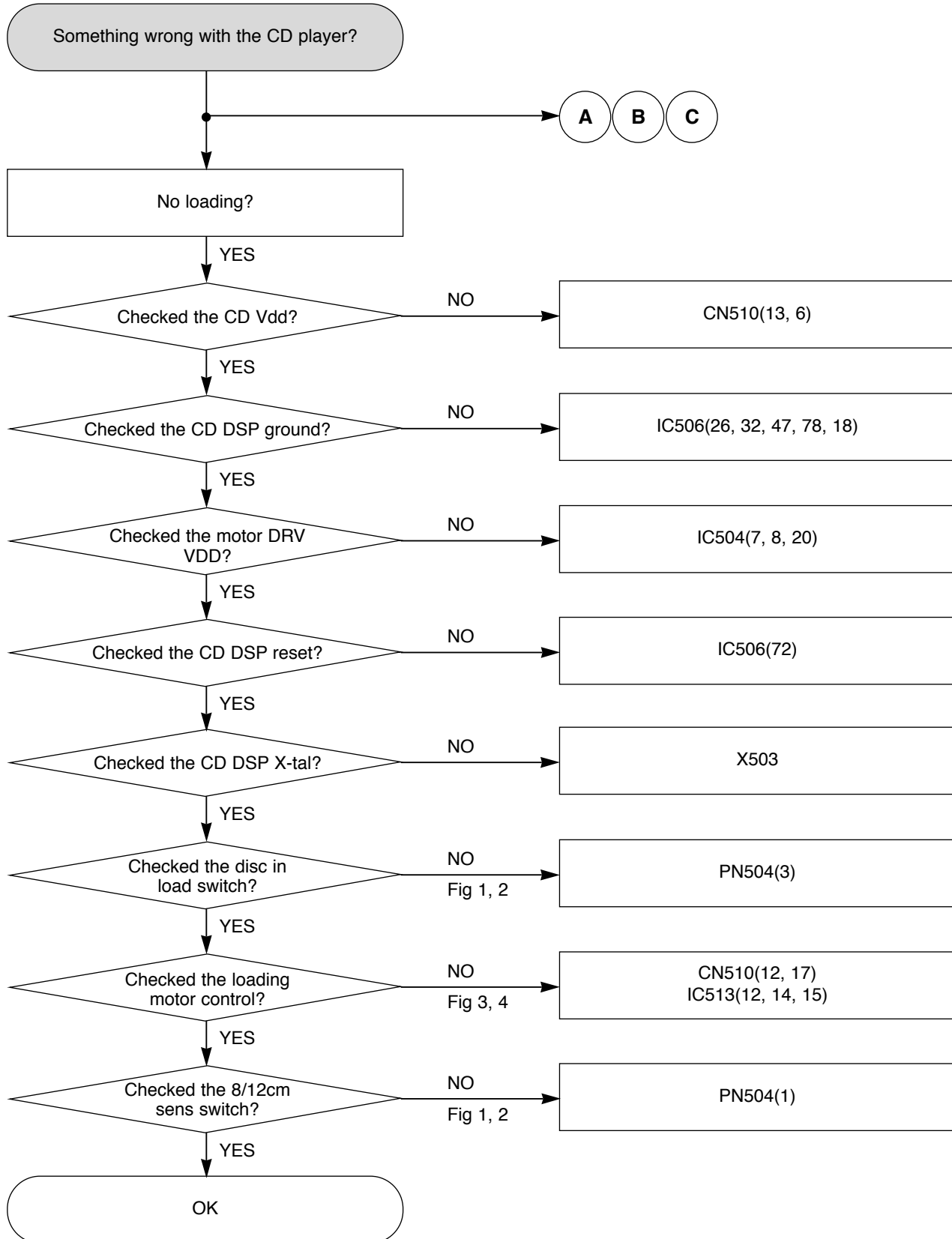


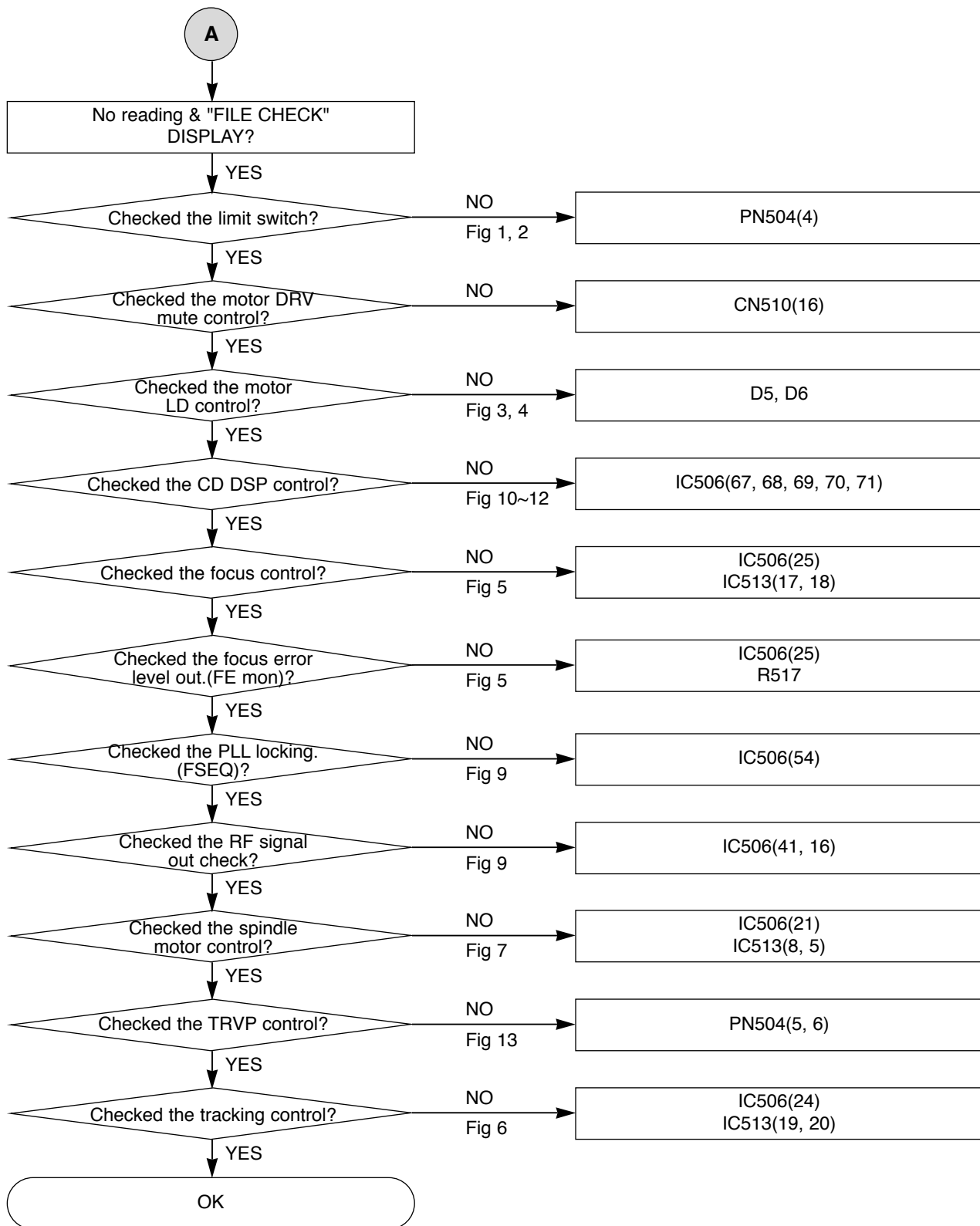
**Picture 1) Power IC desc.**

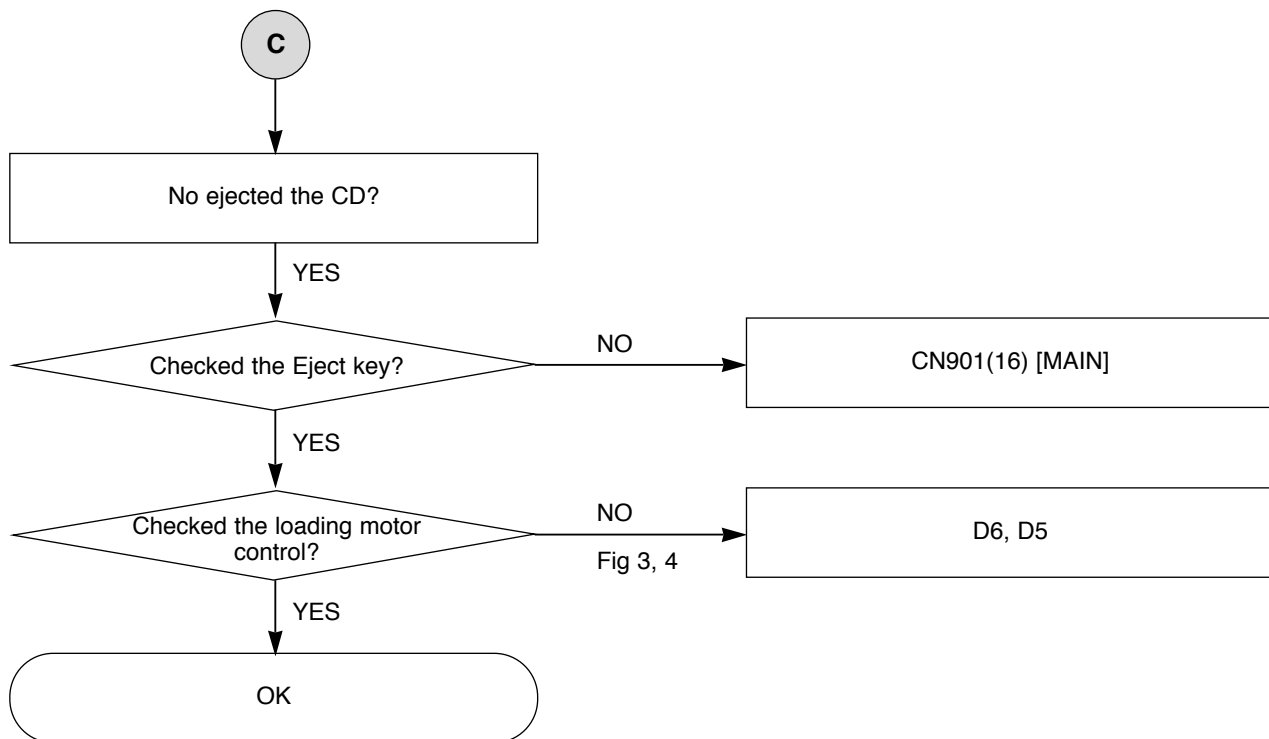
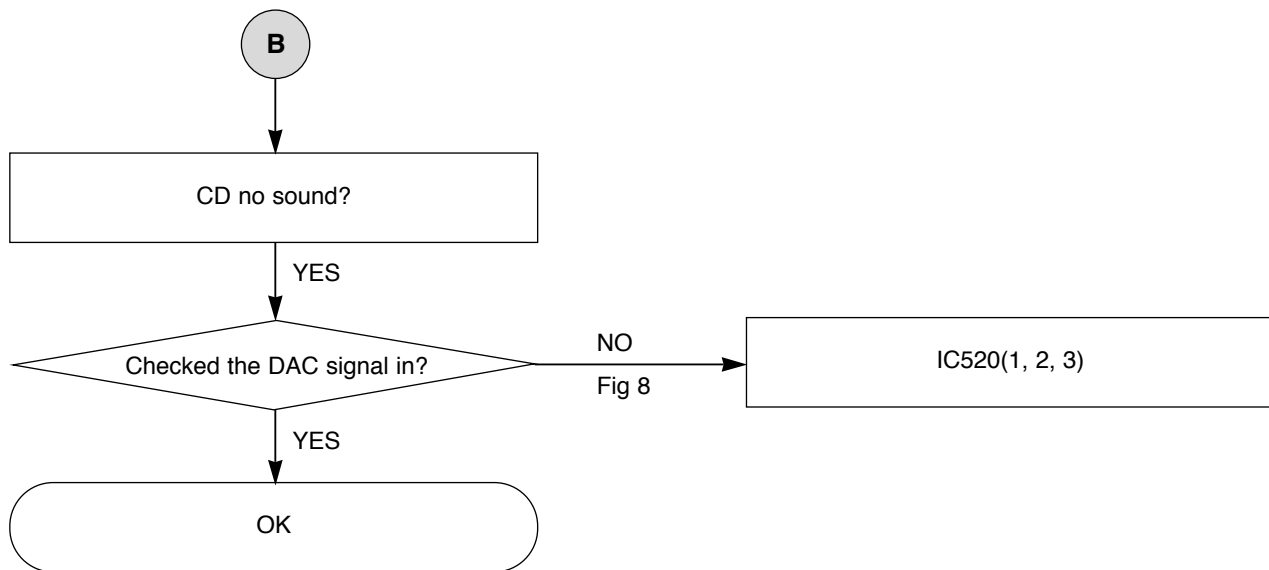
No	Symptom	Check Point	Location No.
<b>DISPLAY &amp; LIGHTING</b>			
1	No Display or Some Display is broken	Checked the LCD DRV Vdd.	Q322,Q316,Q317 IC901(69,70,71,72,73)
		Checked the LCD DRV Ground.	IC901(74)
		Checked the LCD DRV OSC.	IC901(75,76)
		Checked the LCD DRV control.	IC401(75,79,85,86), IC901(77,78,79,80)
		Checked the LCD DRV to LCD Pattern.	IC901(1 ~ 68)
2	No LCD Lighting or Color is different	Checked the LCD Lighting VDD.	Q319,Q320,Q322,IC301(4,9) IC401(64)
		Checked the LED.	LD991, LD992
3	Not available to LCD Lighting control	Checked the LCD Lighting Control.	CN801(11),Q303,Q304,Q321, IC401(58)
		Checked the LED.	LD991,LD992
4	No Key Lighting	Checked the LED Lighting Vdd.	IC301(4,9),IC401(64)
		Checked the LED.	LD901 ~ LD921
5	Don't moved Level bar	Checked the Level Meter control.	IC601(25,26),IC401(9,54)
6	Not available to Dimmer control	Checked the Dimmer control.	CN801(11),Q303,Q304,IC301(4,9)

No	Symptom	Check Point	Location No.
<b>TUNER FUNCTION</b>			
1	Not available to Tuner	Checked the Tuner Vdd.	TU101(4,16),IC301(10),IC401(39) Q350,Q351
		Checked the Tuner Ground.	TU101(3, 5,10,17)
		Checked the PLL data.	TU101(11,12,13,14,15) IC401(67,68,44,45,46)
		Checked the RF signal in.	TU101(1, 2)
		Checked the S-Meter control.	TU101(7)
		Checked the SD & ST IND.	TU101(6)
2	Tuner no sound	Checked the Tuner Signal out.	TU101(8,9), IC601(5,6)
		Checked the AF mute.	TU101(19), IC401(4)
3	Not available to RDS	Checked the RDS data.	TU101(20,21), IC401(65,83)

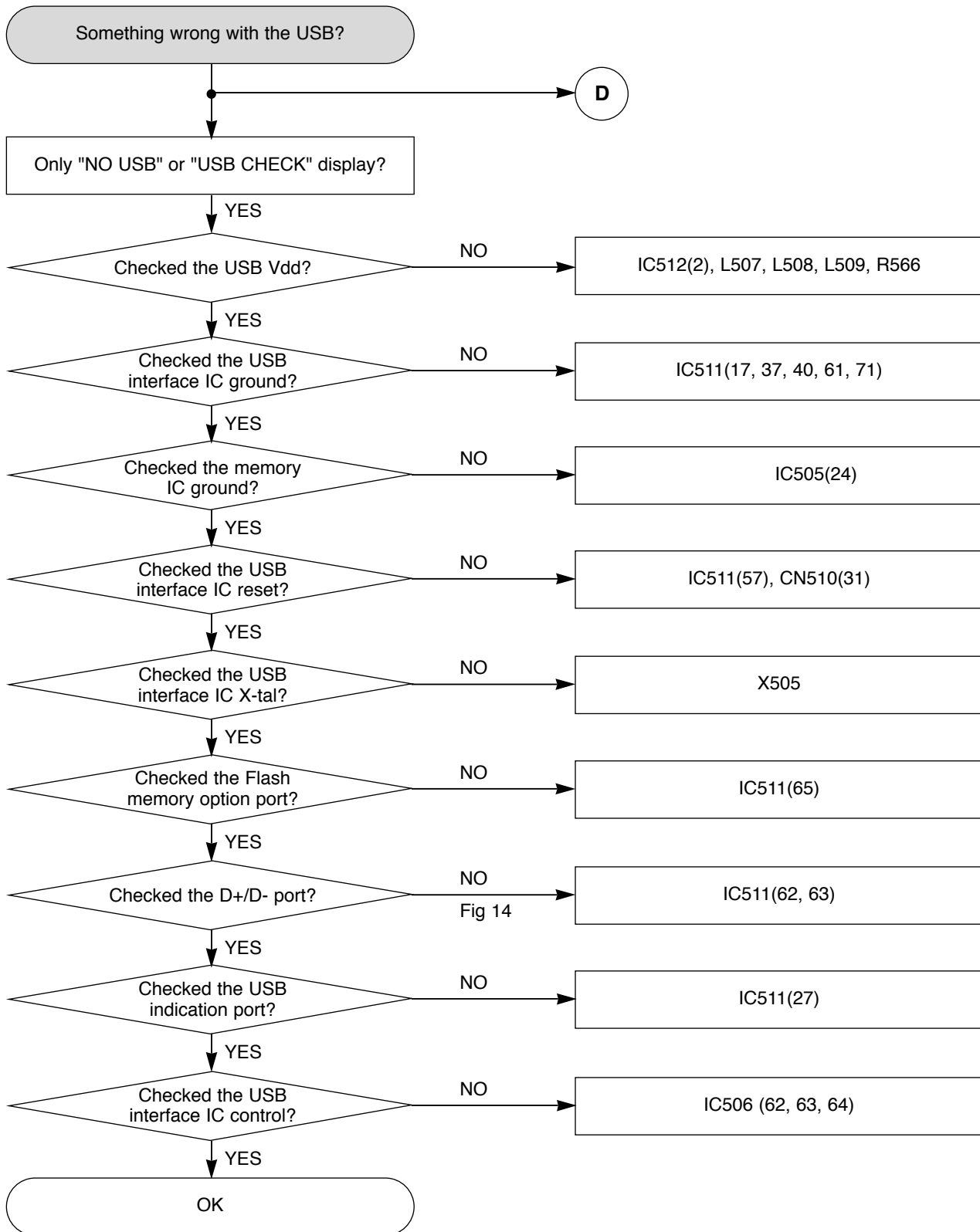
## 2. CD PART TROUBLESHOOTING



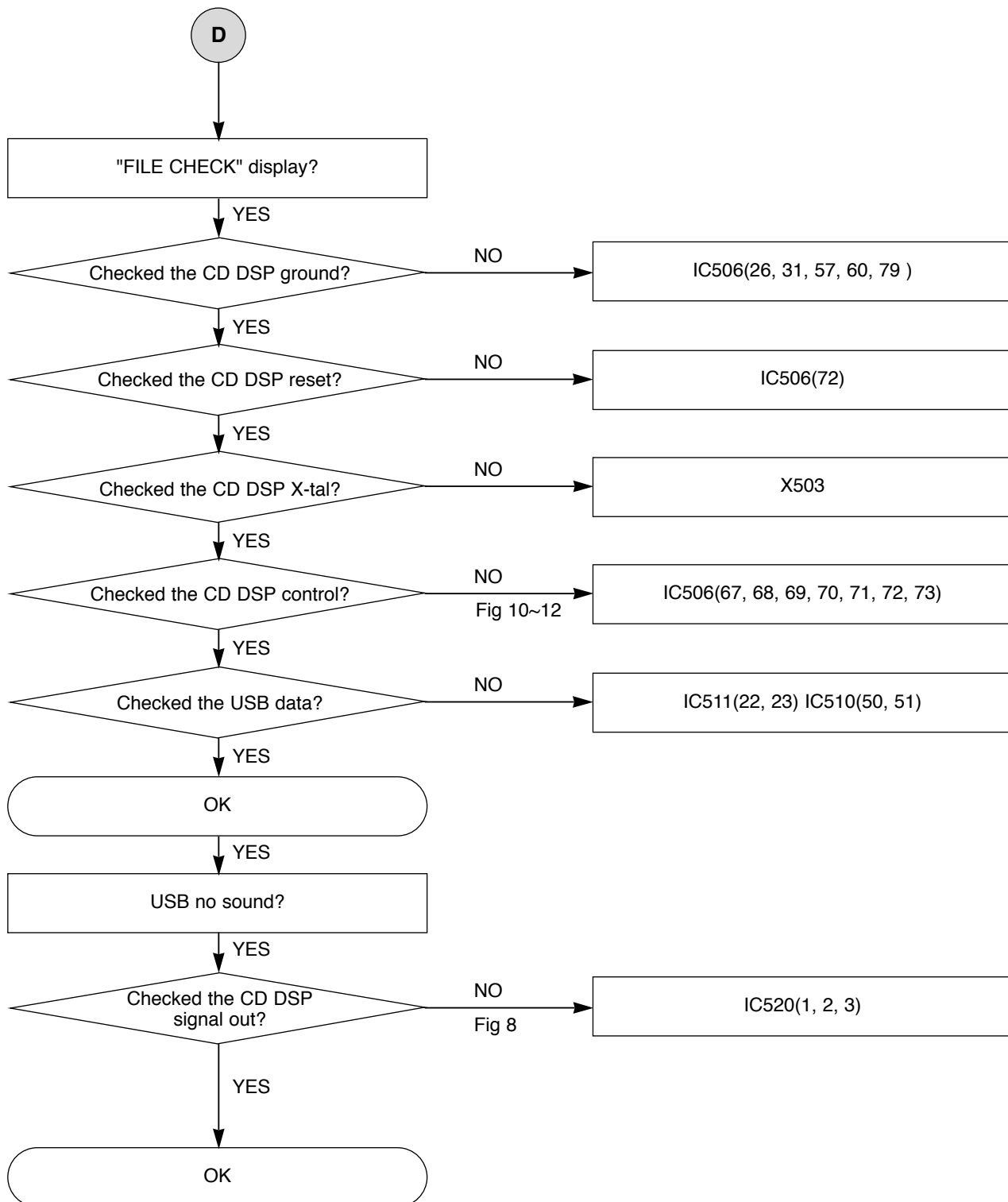




### 3. USB PART TROUBLESHOOTING







## • WAVEFORMS

Fig 1) Switching condition for loading

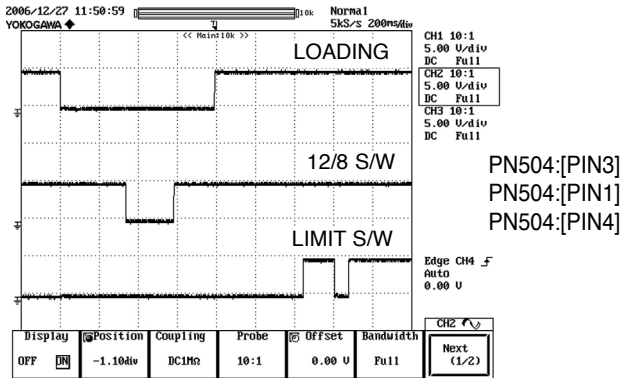


Fig 2) Switching condition for unloading

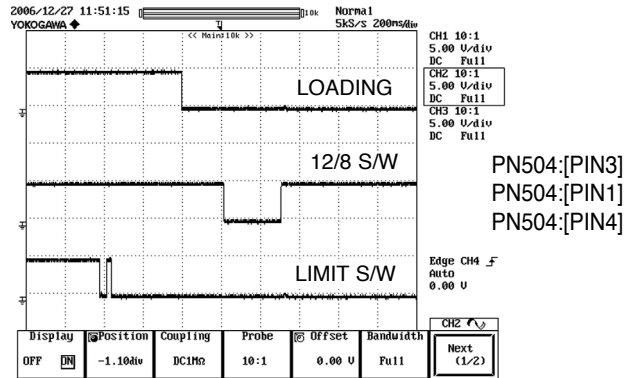


Fig 3) Motor control signal for loading

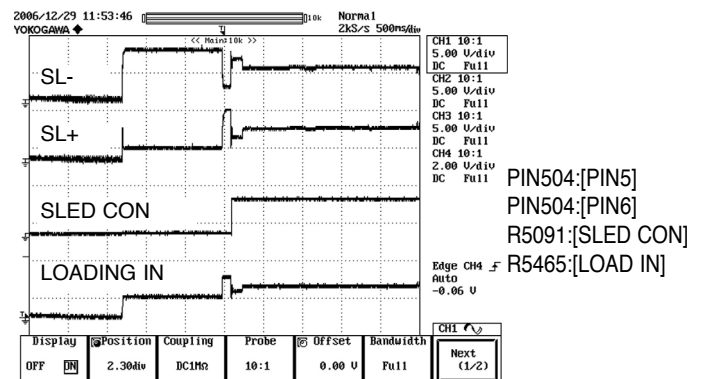
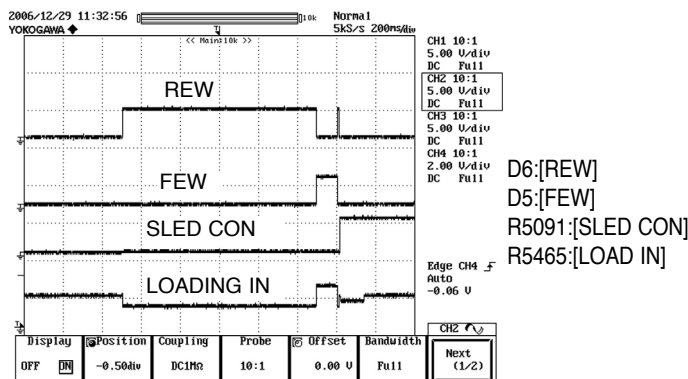


Fig 4) Motor control signal for unloading

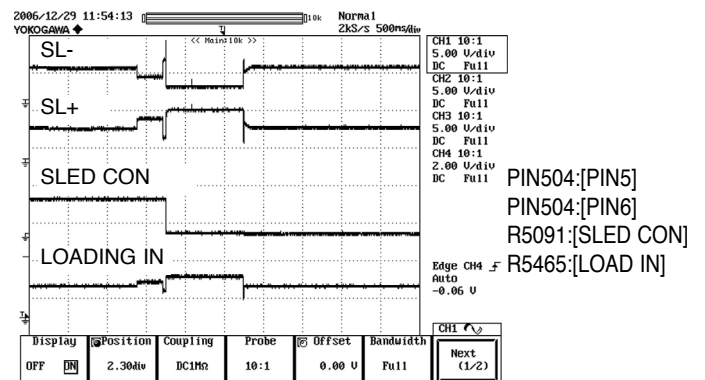
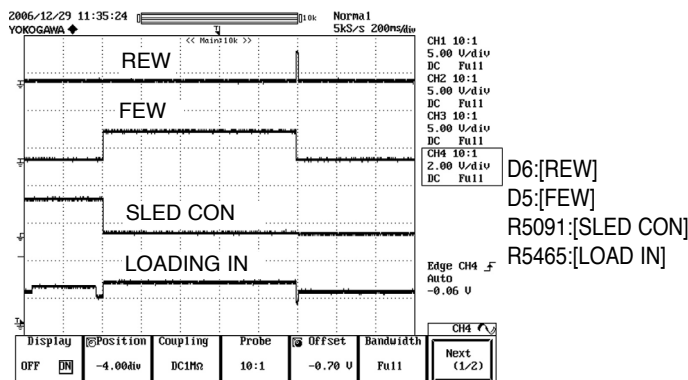


Fig 5) Focus control signal

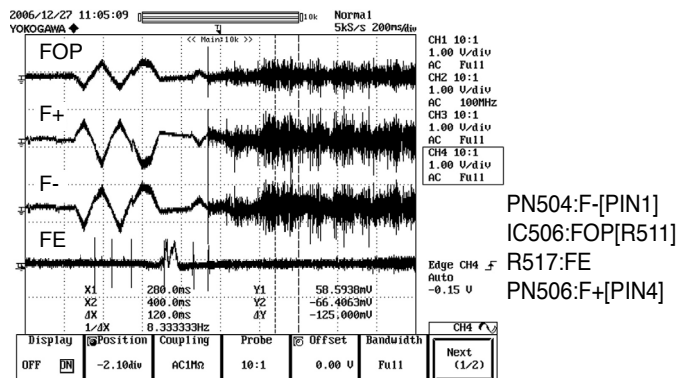


Fig 6) Tracking control signal

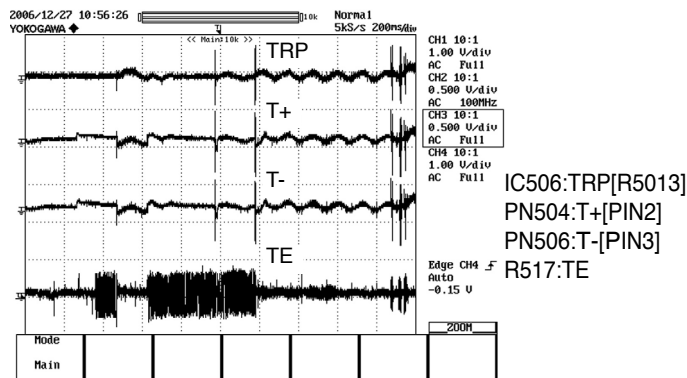


Fig 7) Spindle control signal

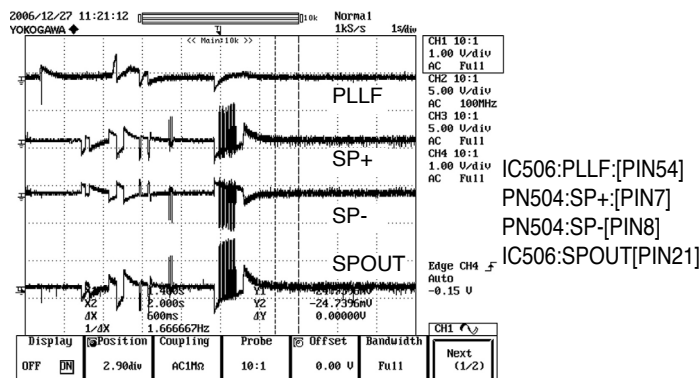


Fig 8) LRCK, BCK, DATA from DAC

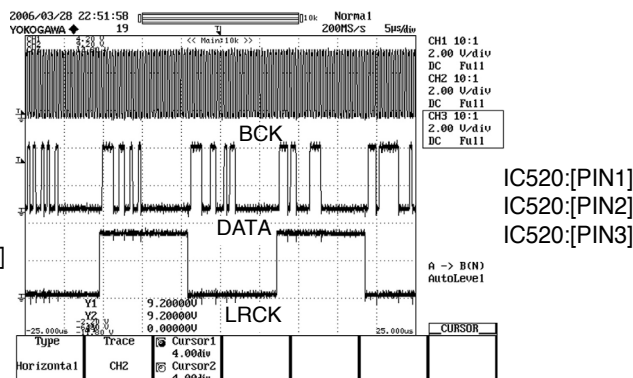


Fig 9) PD, RFOUT

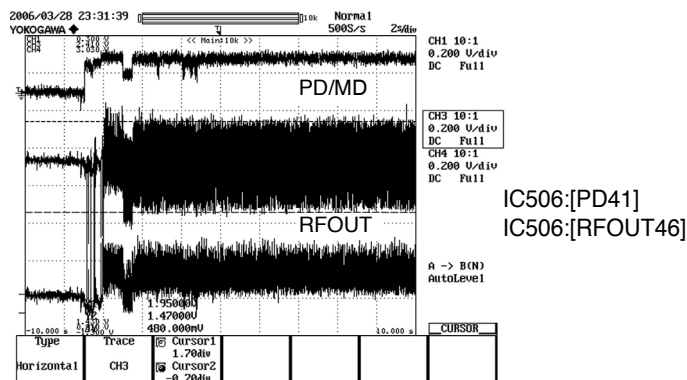


Fig 10) CLK, REQ & DATA

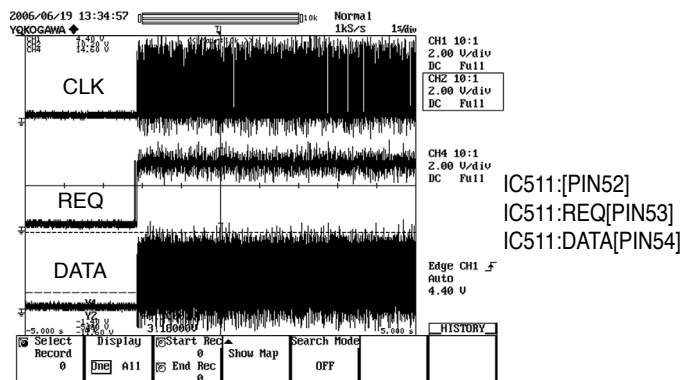


Fig 11) MLD, MDATA & MCLK

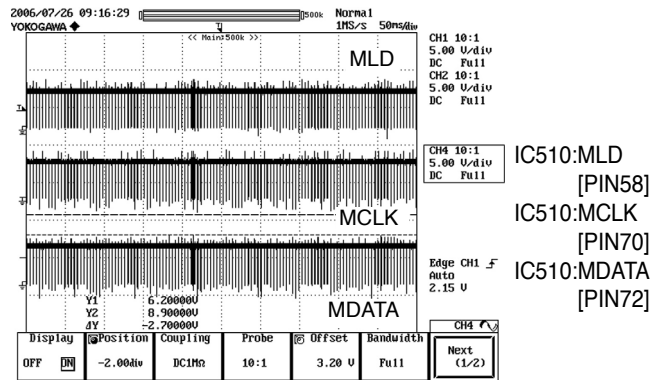
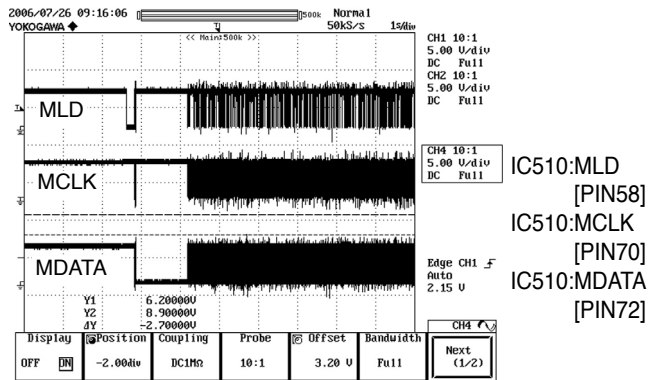


Fig 12) STAT, MDATA & NRST

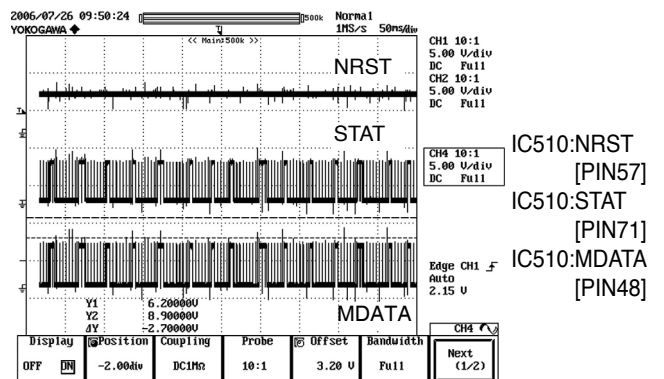
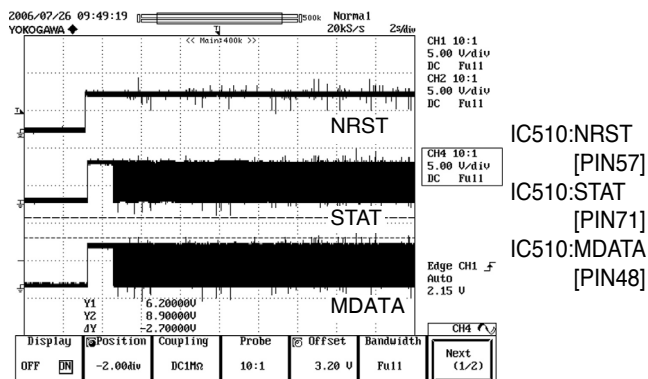


Fig 13) SLED control

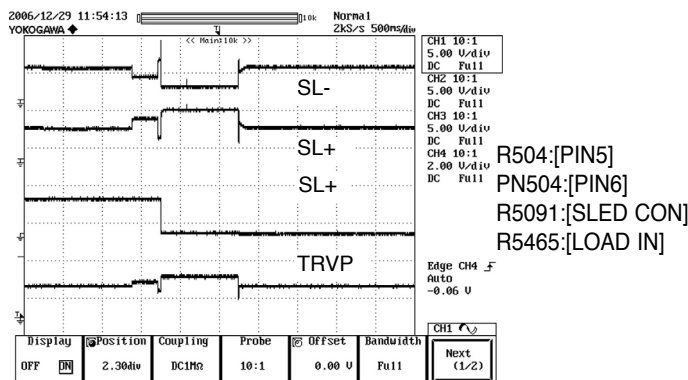
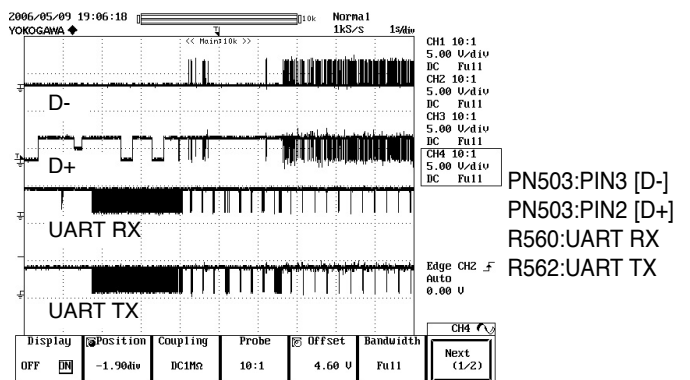


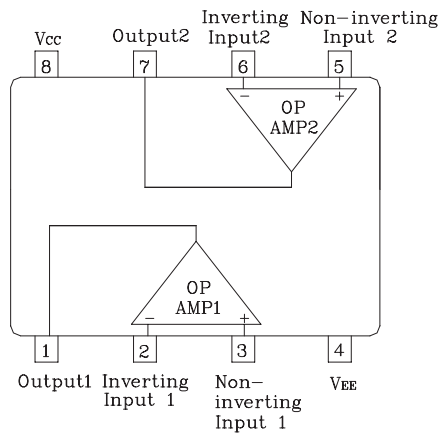
Fig 14) USB D+, D- signal



# INTERNAL BLOCK DIAGRAM OF ICs

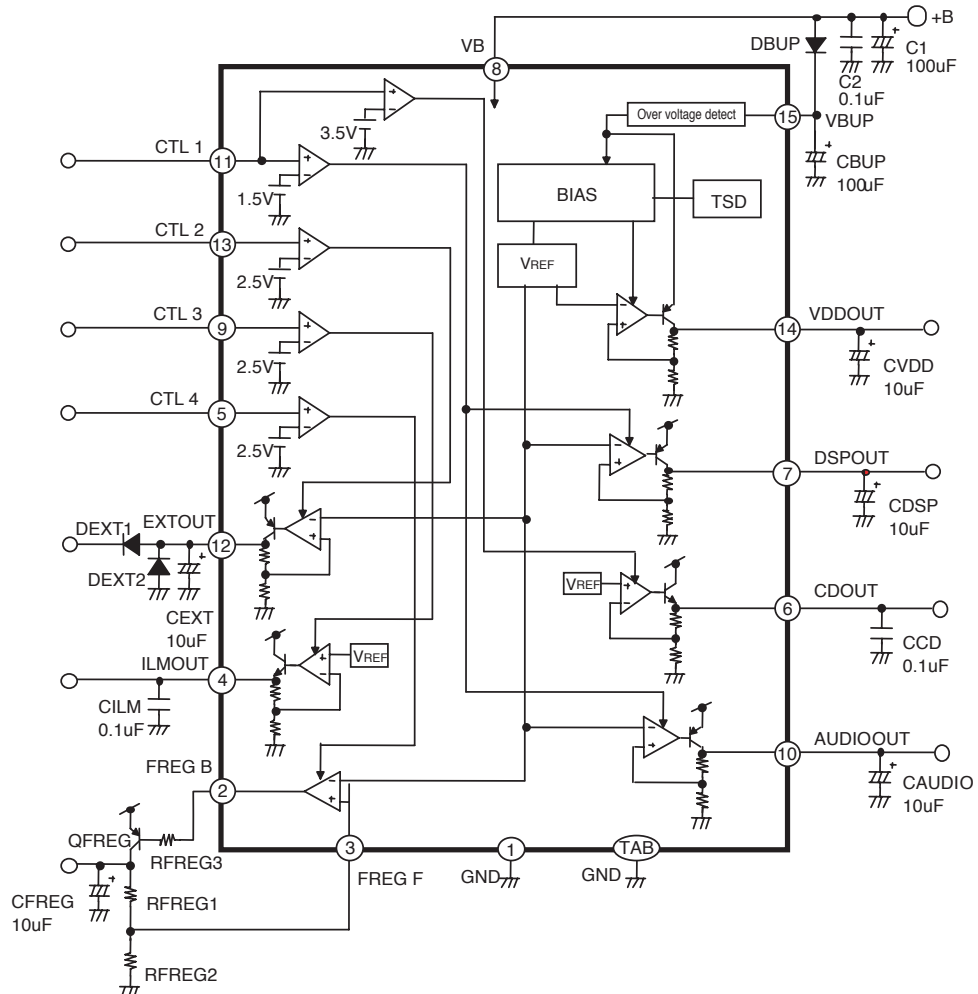
## 1. IC518, IC701 & IC702 (S4580)

### 1-1. BLOCK DIAGRAM



## 2. IC301 (HA13173AH)

### 2-1. BLOCK DIAGRAM



## 2-2. PIN FUNCTION (Note1)

Pin No.	Pin name	Function	Protection function			
			Normal operation	(Note2) TSD On	(Note3) VB=24V	(Note3) VB=50V
1	GND	Ground	-	-	-	-
2	FREG_B	External Trs bass drive (Note4)	On/Off	On/Off	Off	Off
3	FREG_F	FREG feedback terminal	On/Off	On/Off	Off	Off
4	ILMOUT	8.4V output for JLM/500mAmax	On/Off	Off	Off	Off
5	CTL4	FREG control terminal	-	-	-	-
6	CDOUT	8.0V output for CD/1.3Amax (Note4)	On/Off	Off	Off	Off
7	DSPOUT	3.3V output for DSP/250mAmax (Note4)	On/Off	Off	Off	Off
8	VB	Battery	-	-	-	-
9	CTL3	ILM control terminal	-	-	-	-
10	AUDIOOUT	8.4V output for AUDIO/500mAmax (Note4)	On/Off	Off	Off	Off
11	CTL1	DSP, CD, Audio control terminal	-	-	-	-
12	EXTOUT	High side output/600mAmax (Note4)	On/Off	Off	Off	Off
13	CTL2	EXT control terminal	-	-	-	-
14	VDDOUT	5.7V output for micro controller (Note4)	On	On	On	Off
15	VBUP	Back up	-	-	-	-

Note1. In the upper table. "On" means always On. "Off" means compulsory Off and "On/Off" means that it can control by control terminal.

Note2. Thermal protection circuit

A built-in thermal protection circuit (TSD:Thermal shut down) prevents thermal damage to the IC. All outputs except VDD(pin14) and FREG (pin2&3) are switched off when the circuit operates, revert to the original state when the temperature drops to a certain level.

Note3. Overvoltage protection circuit

The overvoltage protection circuit (surge protector) turns off all outputs without Vdd, when VB voltage is more than about 21V. And the overvoltage protection circuit (surge protector) turns off Vdd output with other all outputs, when VB voltage is more than about 26V. When the overvoltage protection operates on VB>=18V condition, the stand by current increases.

Note 4. Overcurrent protection circuit

FREG\_B (pin2), ILMOUT (pin4), CDOUT (pin6), DSPOUT (pin7), AUDIOOUT (pin10), EXITOUT (pin12), VDDOUT (pin14) output circuits are built-in overcurrent protection circuit based on the respective output current. These overcurrent protection circuits limit the current with a curve shape of "7" in the voltage-current graph. This prevents IC destruction due to overcurrent.





## 4-2. PIN DESCRIPTION

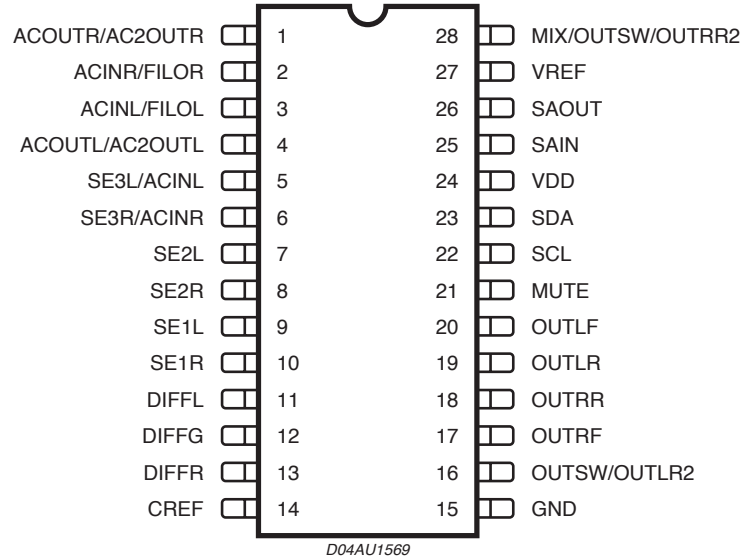
Pin	Name in Micom	Name in Model	Enable I/O	I/O setted	Output Format	Description
1	P60/SCL0	PEV_CLK	I/O	O	N-CH	Clock output to TDA7419 for the volume control
2	P61/SDA0	PEV_DE	I/O	O	N-CH	Data output to TDA7419 for the volume control
3	P62	PPWR_MUTE	I/O	O	N-CH	To Power amp, "MUTE" command output
4	P63	PAF_MUTE	I/O	O	N-CH	AF mute
5	P31/TI03/TO03/INTP4	PRMC	I/O	I	-	Remocon input
6	P64/RD'	PSOFT_MUTE	I/O	O	CMOS	Direct volume mute signal output
7	P65/WR0'	PEALA_SW1	I/O	O	CMOS	EALA control output 1
8	P66/WR1'	PEALA_SW2	I/O	O	CMOS	EALA control output 2
9	P67/ASTB	PSECP_CLK	I/O	O	CMOS	Spectrum analyze clock output to TDA7419
10	P77/EX23/KR7/INTP11	PSTANDBY	I/O	O	CMOS	To PowerR amp, "STAND-BY" command output
11	P76/EX22/KR6/INT10	PDECK_LD	I/O	I	-	Deck load SW
12	P75/EX21/KR5/INT9	PCDP_IBLK	I/O	I	-	SubQ ack
13	P74/EX20/KR4/INTP8	PCDP_VDET	I/O	I	-	Vibration detection
14	P73/EX19/KR3	PCDP_POWER	I/O	O	CMOS	CDP power on
15	P72/EX18/KR2	PDECK_INN	I/O	I	-	Deck inner SW
16	P71/EX17/KR1	PDECK_12/8	I/O	I	-	Deck 2cm disc detect SW
17	P70/EX16/KR0	PSLED_CTRL	I/O	O	CMOS	Deck sled/Loading motor selector
18	P06/WAIT'	PCDP_FEW	I/O	O	CMOS	Loading motor loading
19	P05/CLKOUT	PCDP_REW	I/O	O	CMOS	Loading motor unloading
20	EVSS1		-			Ground Potential for Ports
21	P80/EX0	PDRV_MUTE	I/O	O	CMOS	Deck driver IC mute
22	P81/EX1	PDAC_MUTE	I/O	O	CMOS	DAC mute
23	P82/EX2	PCDP_RST	I/O	O	CMOS	CDP reset
24	P83/EX3	PCDP_MLD	I/O	O	CMOS	DSP ACK
25	P84/EX4	PZERO_MUTE	I/O	I	-	DAC zero mute monitor
26	P85/EX5	PISP	I/O	O	CMOS	USB Flash upgrade enable
27	P86/EX6	PUSB_POWER(PBT)	I/O	O	CMOS	USB power on/BT power on(3.3V Ctrl)
28	P87/EX7	PUSB_SW	I/O	I	-	USB device detect sw
29	P30/INTP3/RTC1HZ	PUSB_RESET	I/O	O	CMOS	OTG reset
30	EVDD1		-			Positive power supply for ports
31	P50/EX8	PUSB_PROTECT	I/O	I	-	Protection IC overcurrent detection
32	P51/EX9	POPT_IN0	I/O	-		For diode option check, signal 1 or 2 input0
33	P52/EX10	POPT_IN1	I/O	I	-	For diode option check, signal 1 or 2 input1
34	P53/EX11	POPT_IN2	I/O	I	-	For diode option check, signal 1 or 2 input2
35	P54/EX12	POPT_OUT0	I/O	O	CMOS	For diode option check, signal 1 output
36	P55/EX13	POPT_OUT1	I/O	O	CMOS	For diode option check, signal 2 output
37	P56/EX14	POPT_OUT2	I/O	O	CMOS	For diode option check, signal 3 output
38	P57/EX15	PACC_IN	I/O	I	-	ACC in
39	P17/EX31/TI02/TO02	PACC_OUT	I/O	O	CMOS	ACC out
40	P16/EX30/TI01/TO01/INTP5	PVOLA	I/O	O	CMOS	Encoder volume terminal #A input
41	P15/EX29/RTCDIV/RTCCCL	PVOLB	I/O	O	CMOS	Encoder volume terminal #A input
42	P14/EX28/RxD3	PUSB_RX/PBT_RX	I/O	I	-	Data input for USB/BT
43	P13/EX27/TxD3	PUSB_TX/PBT_TX	I/O	O	CMOS	Data output for USB/BT
44	P12/EX26/SO00/TxD0	PPLL_DO	I/O	O	CMOS	Data output for PLL IC
45	P11/EX25/SI00/RxD0	PPLL_DI	I/O	I	-	Data input for PLL IC
46	P10/EX24/SCK00'	PPLL_CLK	I/O	O	CMOS	CLK output for PLL IC
47	AVREF1		-			<ul style="list-style-type: none"> <li>• A/D converter reference voltage input</li> <li>• Positive power supply for P20 to P27, P150 to P157, and A/D converter</li> </ul>
48	P110/ANO0	PLINE_MUTE	I/O	O	CMOS	Line out mute
49	P111/VNO1	PTUNER_MUTE	I/O	O	CMOS	Tuner <----> VR IC mute
50	AVREF0		-			<ul style="list-style-type: none"> <li>• D/A converter reference voltage input</li> <li>• Positive power supply for P110, P111, and D/A converter</li> </ul>



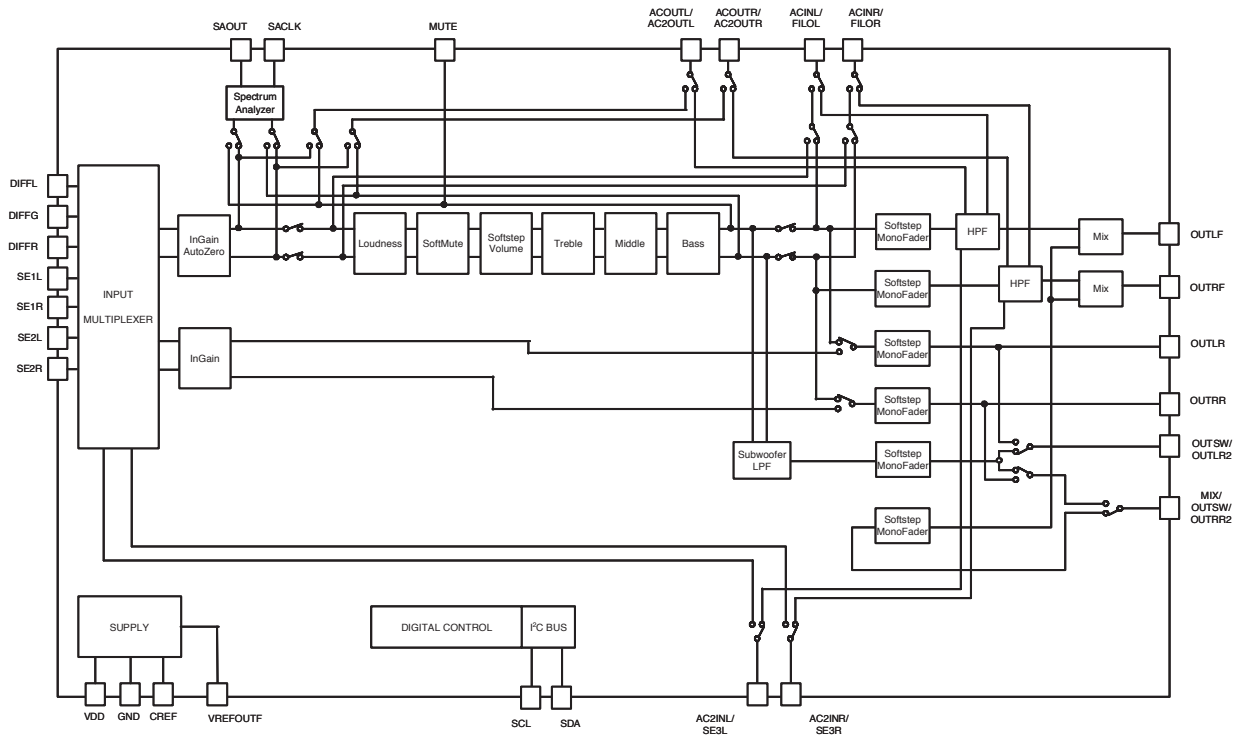
Pin	Name in Micom	Name in Model	Enable I/O	I/O setted	Output Format	Description
51	AVSS					
52	P157/ANI15	PKEY1	I/O	I	-	Key #1 line input
53	P156/ANI14	PKEY2	I/O	I	-	Key #2 line input
54	P155/ANI13	PLEVEL_METER	I/O	I	-	Level meter input
55	P154/ANI12	PSMETER	I/O	I	-	Radio station's strength signal input
56	P153/ANI11	PQUALTY	I/O	I	-	Connect to tuner pack QUALITY
57	P152/ANI10	PEJECT	I/O	I	-	Eject key input
58	P151/ANI9	PDIM_OUT	I/O	O	CMOS	Dimmer output
59	P150/ANI8	PLIGHT	I/O	O	CMOS	Backlight control output
60	P27/ANI7	PAUX_MUTE	I/O	O	CMOS	AUX mute
61	P26/ANI6	PAUDIO_MUTE	I/O	O	CMOS	VR IC <--> PWR AMP mute
62	P25/ANI5	PTTEL_MUTE	I/O	O	CMOS	Telephone mute input
63	P24/ANI4	PREMOTE	I/O	O	CMOS	External amp on
64	P23/ANI3	PPWR	I/O	O	CMOS	Power on
65	P22/ANI2	PRDS_DI	I/O	I	-	From tuner pack, RDS data input
66	P21/ANI1	PDIM_IN	I/O	I	-	Dimmer input
67	P20/ANI0	PEEPROM_CE	I/O	O	CMOS	EEPROM Chip select
68	P130	PPLL_CE	O	O	CMOS	PLL chip select
69	P131/TI06/TO06	PSD_ST	I/O	I	-	SD level input from Tuner pack
70	P04/SCK10/SCL1	PART_EN	I/O	O	-	ART Enable input
71	P03/SI10/RxD1/SDA1	PART_RX	I/O	I	-	Data input for ART
72	P02/SO10/TXD1	PART_TX	I/O	I	CMOS	Data output for ART
73	P01/TO00	PFRT_DETECT	I/O	I	-	Front detaching/attaching detect
74	P00/TI00	PFRT_OPEN I/O	I	-	-	Front open/close detect
75	P145/TI07/TO07	PFRT_RST	I/O	O	CMOS	Front micom(LCD drv) reset
76	P144/SO20/TxD2	PCDP_DO	I/O	O	CMOS	Data output for CDP
77	P143/SI20/RxD2/SDA2	PCDP_DI	I/O	I	-	Data input for CDP
78	P142/SCK20/SCL2	PCDP_CLK	I/O	O	CMOS	CLK output for CDP
79	P141/PCLBUZ1/INTP7	PFRT_CE	I/O	I	-	Data enable output to front micom(LCD drv)
80	P140/PCLBUZ0/INTP6	PBEEP	I/O	O		CMOS Buzzer output
81	P120/INTP0/EXLVI	PEXLVI	I/O	I	-	Low voltage detector(Connect to Vdd)
82	P47/INTP2 PFLMD0_	CTR	I/O	O	CMOS	Disc download FLMD0 control(Connect to FLMD0(Pin93))
83	P46/INTP1/TI05/TO05	PRDS_CLK	I/O	I	-	From tuner pack, RDS data input
84	P45/SO01	PFRT_DO	I/O	O	CMOS	Data output to front micom(LCD drv)
85	P44/SI01	PFRT_DI	I/O	I	-	Data input from front micom(LCD drv)
86	P43/SCK01'	PFRT_CLK	I/O	O	CMOS	CLK output to front micom(LCD drv)
87	P42/TI04/TO04	PANT	I/O	O	CMOS	Antena control output
88	P41/TOOL1	Download_CLK	I/O	-	-	CLK for onboard debugger
89	P40/TOOL0	Download_IO	I/O	-	-	Data I/O for flash memory programmer (Pull-up register(10K))
90	RESET'	-	-	-	-	System reset input
91	P124/XT2	-	I	I	-	Sub clock 32.768 KHz
92	P123/XT1	-	I	I	-	Sub clock 32.768 KHz
93	FLMD0	-	-	-	-	Flash memory programming mode setting
94	P122/X2/EXCLK	-	I	I	-	X-tal 19.2 MHz
95	P121/X1	-	I	I	-	X-tal 19.2 MHz
96	REGC	-	-	-	-	Connect to VSS via a capacitor (0.47 to 1 $\mu$ F)
97	VSS	-	-	-	-	Ground
98	EVSS0	-	-	-	-	Ground Potential for Ports
99	VDD	-	-	-	-	Positive power supply (+5V)
100	EVDD0	-	-	-	-	Positive power supply (+5V) For Ports

# 5. IC601 (TDA7419)

## 5-1. PIN CONFIGURATION



## 5-2. BLOCK DIAGRAM

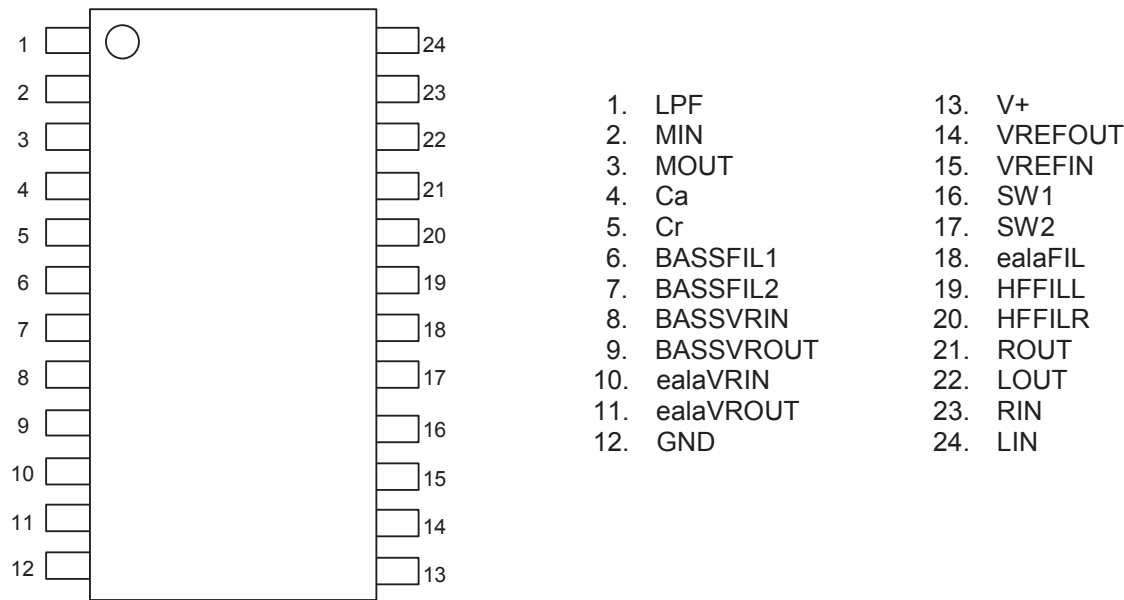


### 5-3. PIN DESCRIPTION

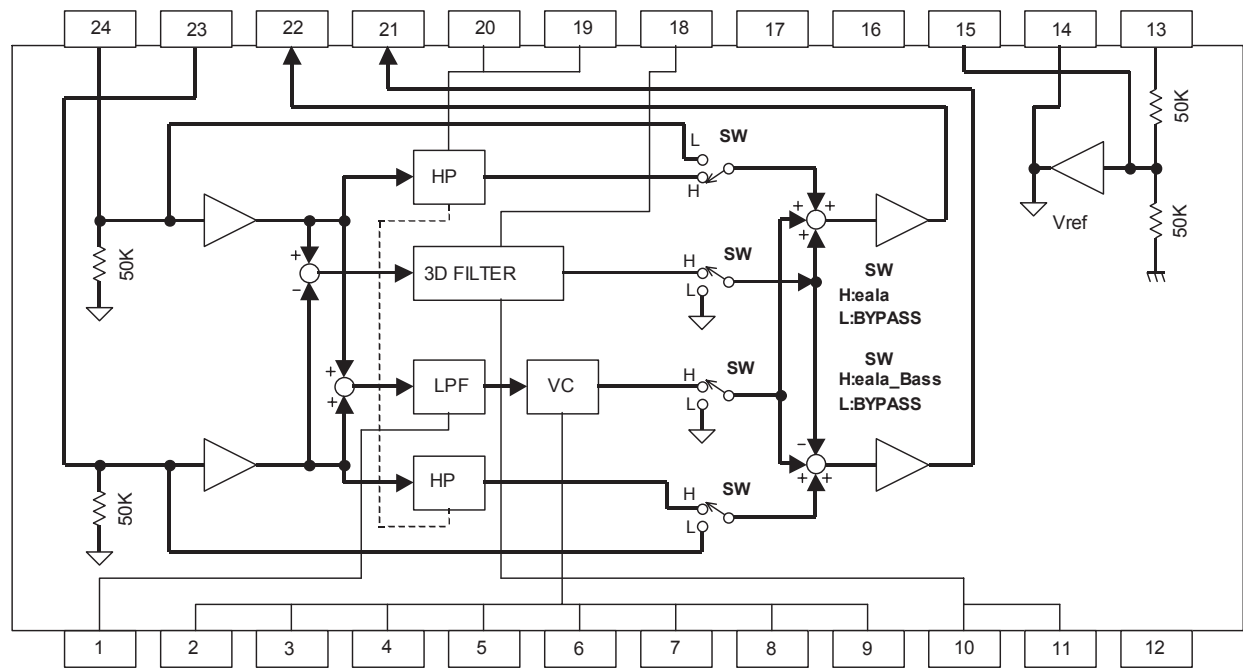
Pin N#	Pin Name	Function	I/O
1	ACOUTR / AC2OUTR	AC coupling right output / HPF filter AC2OUT right channel	O
2	ACINR / FILO R	AC coupling right input / HPF filter FILO right channel	I/O
3	ACINL / FILO L	AC coupling left input / HPF filter FILO left channel	I/O
4	ACOUTL / AC2OUTL	AC coupling left output / HPF filter AC2OUT left channel	O
5	SE3L / ACINL	Single-ended input 3 left channel / AC coupling left input	I
6	SE3R / ACINR	Single-ended input 3 right channel / AC coupling right input	I
7	SE2L	Single-ended input 2 left channel	I
8	SE2R	Single-ended input 2 right channel	I
9	SE1L	Single-ended input 1 left channel	I
10	SE1R	Single-ended input 1 Right channel	I
11	DIFFL	Pseudo differential stereo input left	I
12	DIFFG	Pseudo differential stereo input common	I
13	DIFFR	Pseudo differential stereo input right	I
14	CREF	Reference capacitor	O
15	GND	Ground	S
16	OUTSW / OUTLR2	Subwoofer output / 2 <sup>nd</sup> rear left output	O
17	OUTRF	Front right output	O
18	OUTRR	Rear right output	O
19	OUTLR	Rear left output	O
20	OUTLF	Front left output	O
21	MUTE	External mute pin	I
22	SCL	I2C bus clock	I
23	SDA	I2C bus data	I/O
24	VDD	Supply	S
25	SAIN	Spectrum analyzer clock input	I
26	SAOUT	Spectrum analyzer output	O
27	VREF	Vref output	O
28	MIX / OUTSW / OUTRR2	Mix input / Additional subwoofer output / 2 <sup>nd</sup> rear right output	I/O

# 6. IC602 (NJM2706-DMP24)

## 6-1. PIN CONFIGURATION

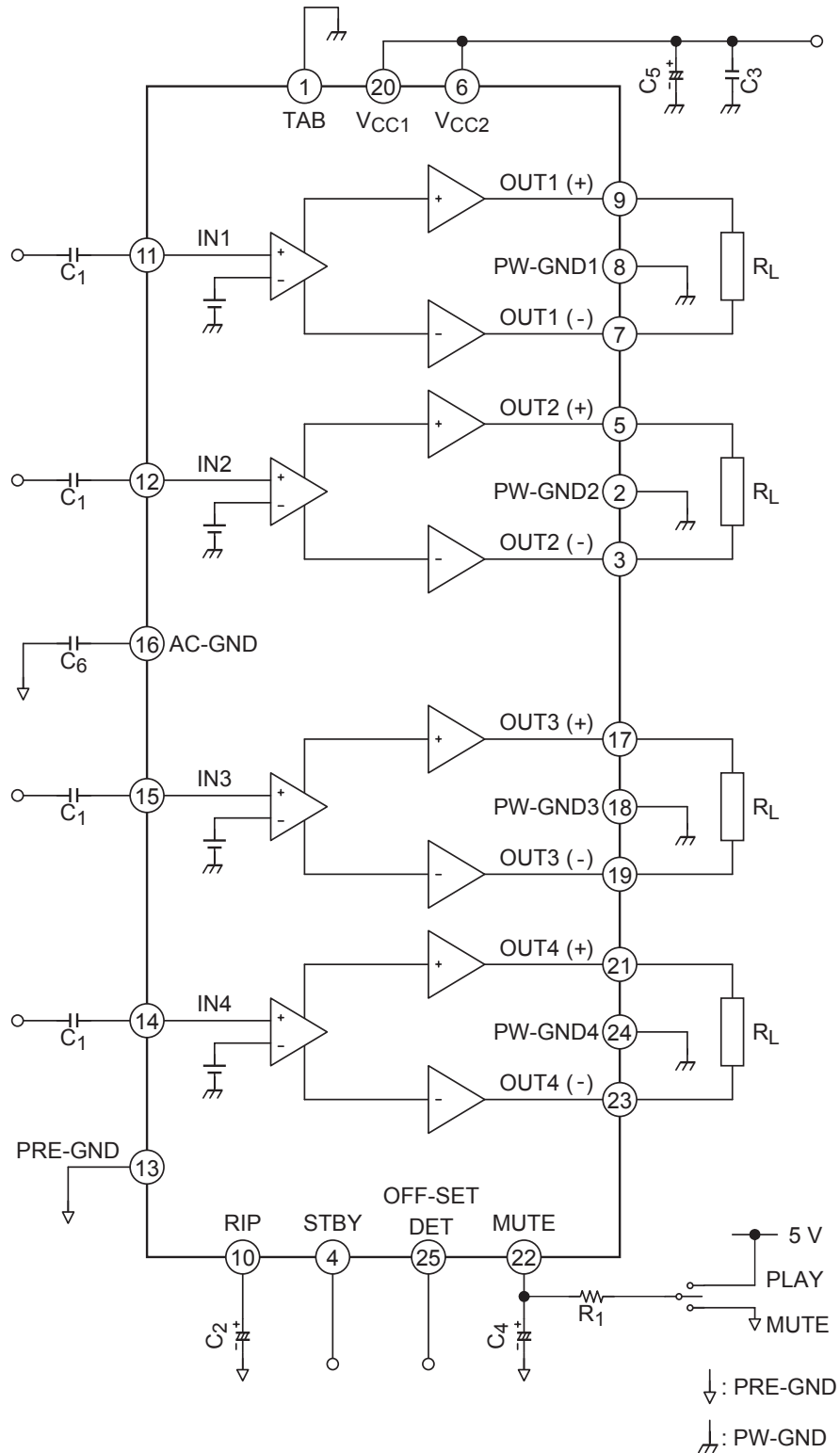


## 6-2. BLOCK DIAGRAM



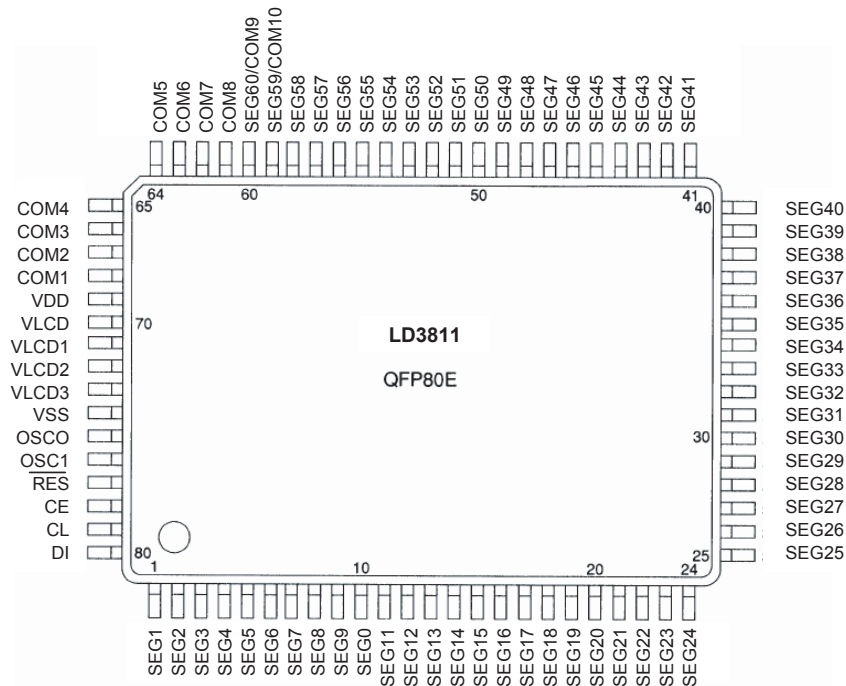
## 7. IC801 (TB2904HQ)

### 7-1. BLOCK DIAGRAM



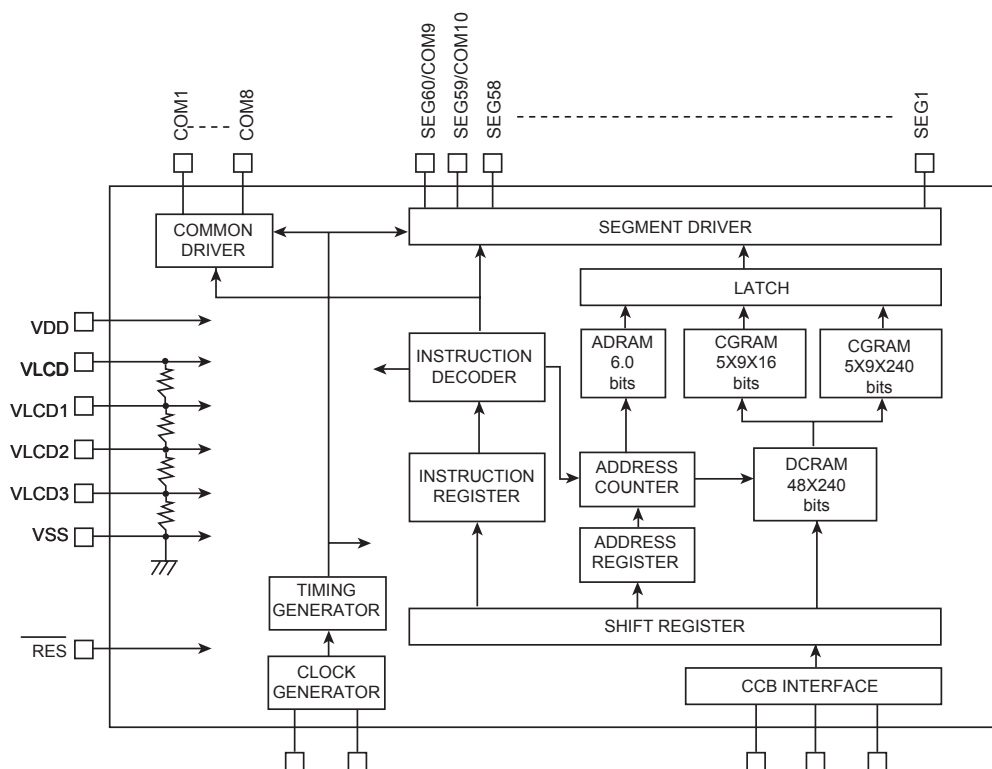
## 8. IC901 (LD3811)

### 8-1. PIN CONFIGURATION



A10711

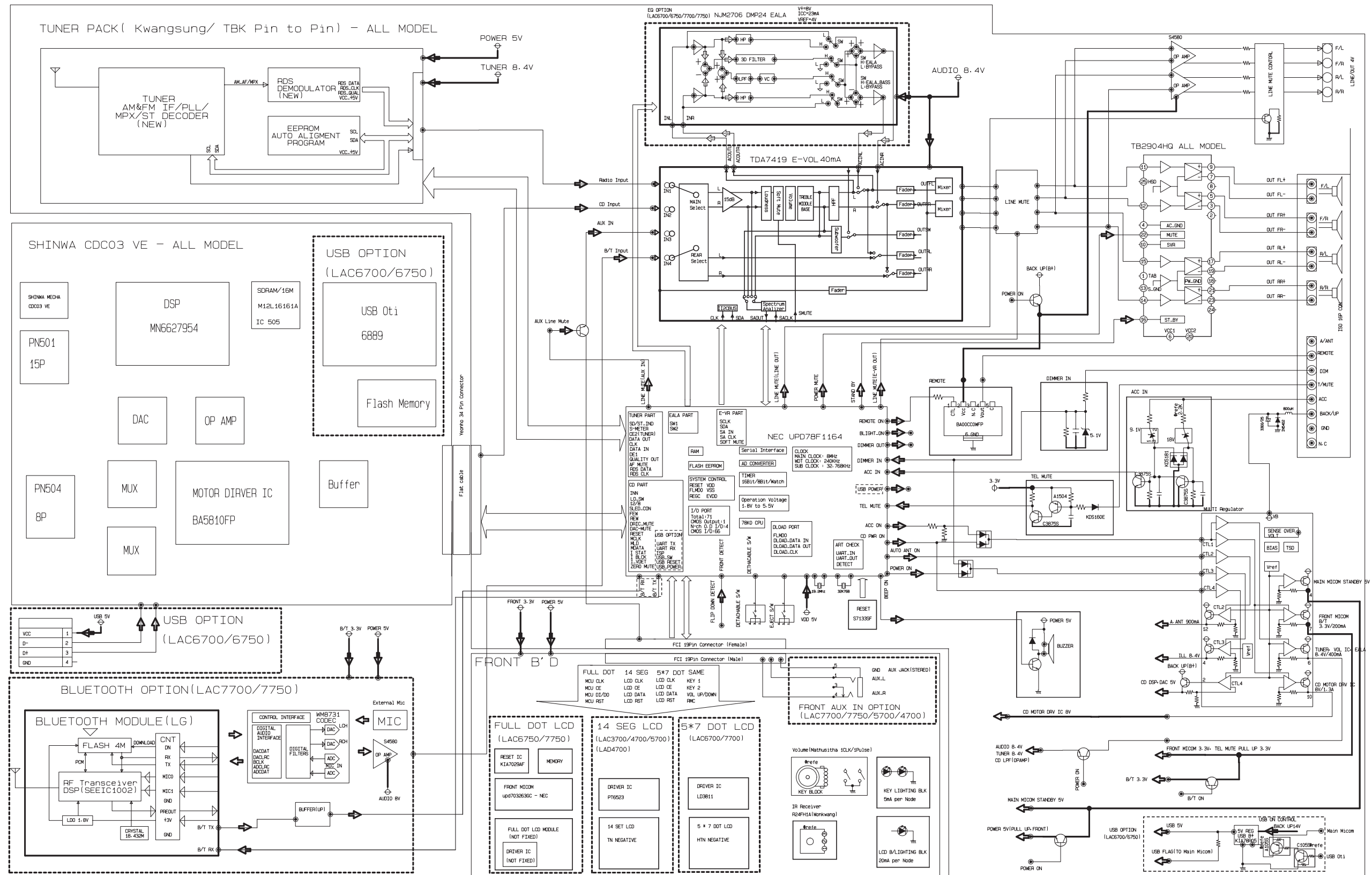
### 8-2. BLOCK DIAGRAM



### 8-3. PIN FUNCTIONS

Pin	Pin No.		Function	Active	I/O	Handling when unused
	LC75811E	LD75811W				
<b>SEG1 to SEG58</b>	1 to 58	79, 80 1 to 56	<b>Segment driver outputs.</b> The SEG59/COM10 and SEG60/COM9 pins can be used as common driver outputs under the "set display Technique" instruction.	-	O	OPEN
<b>SEG59/COM10</b> <b>SEG60/COM9</b>	59 60	57 58				
COM1 to COM8	68 to 61	66 to 59	Common driver outputs.	-	O	OPEN
OSCI	76	74	Oscillator connections. An oscillator circuit is formed by connecting an external resistor and capacitor at these pins.	-	I	GND
OSCO	75	73		-	O	OPEN
CE	78	76	Serial data transfer inputs. These pins are connected to the microcontroller.  CE: Chip enable CL: Synchronization clock DI: Transfer data	H	I	GND
CL	79	77			I	
DI	80	78		-	I	
RES	77	75	Reset signal input. • When RES is low (VSS): • Display off SEG1 to SEG58 = "L" (Vss) SEG59/COM10 and SEG60/COM9 = iLi (Vss) COM1 to COM8 = "L" (VSS). • Serial data transfer is disabled. • The OSCI/OSCO pin oscillator is stopped. • When RES is high (VDD): • Display on after a ldisplay on/off controli (display on state setting) instruction is executed. • Serial data transfers are enabled. • The OSCI/OSCO pin oscillator operates.	L	I	GND
VLCD1	71	69	Used for applying the LCD drive 3/4 bias voltage externally.	-	I	OPEN
VLCD2	72	70	Used for applying the LCD drive 2/4 bias voltage externally.	-	I	OPEN
VLCD3	73	71	Used for applying the LCD drive 1/4 bias voltage externally.	-	I	OPEN
VDD	69	69	Logic block power supply connection. Provide a voltage of between 2.7 and 6.0 V.	-	-	-
VLCD	70	68	LCD driver block power supply connection. Provide a voltage of between 4.5 and 10.0 V.	-	-	-
VSS	74	72	Power supply connection. Connect to ground.	-	-	-

# BLOCK DIAGRAM

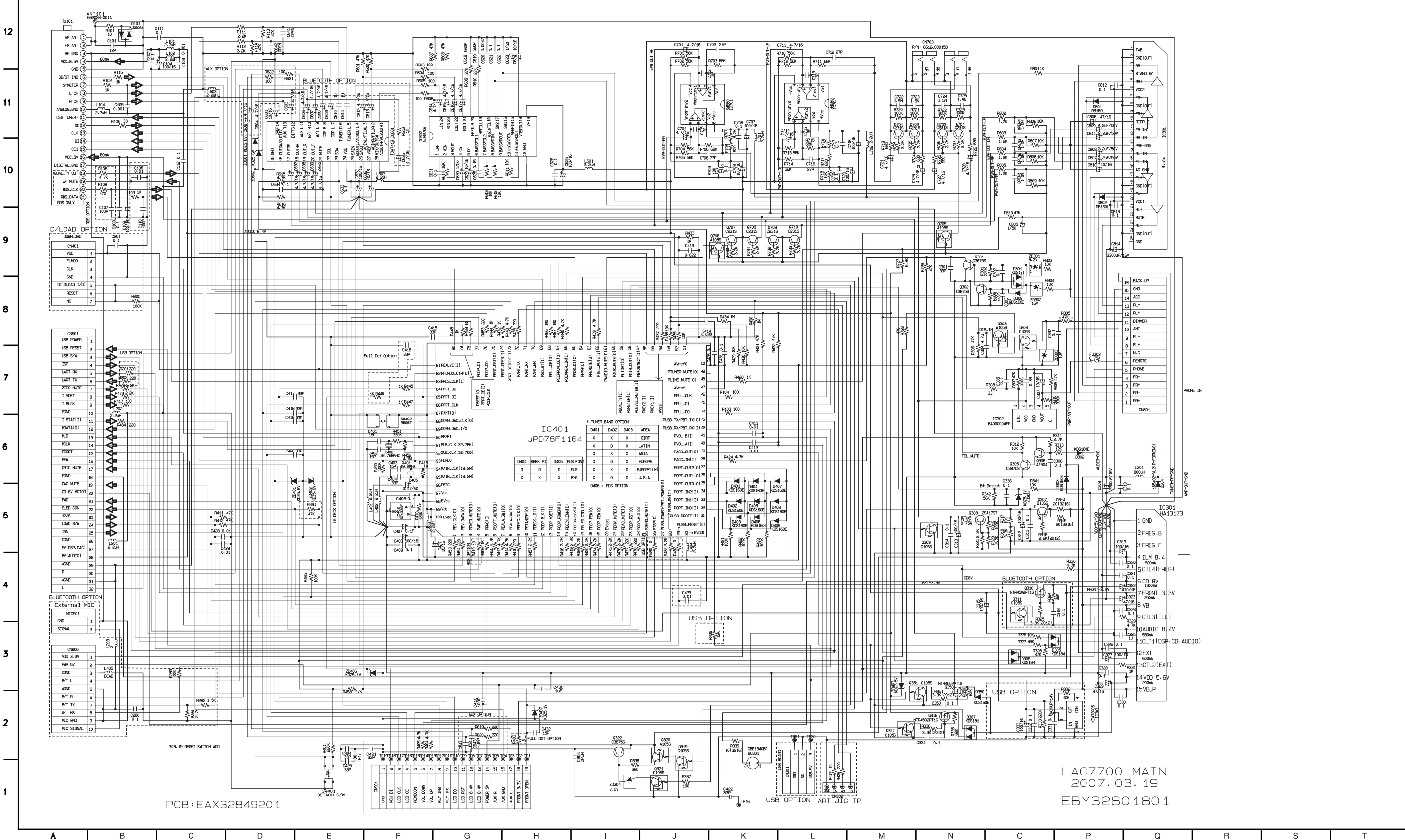


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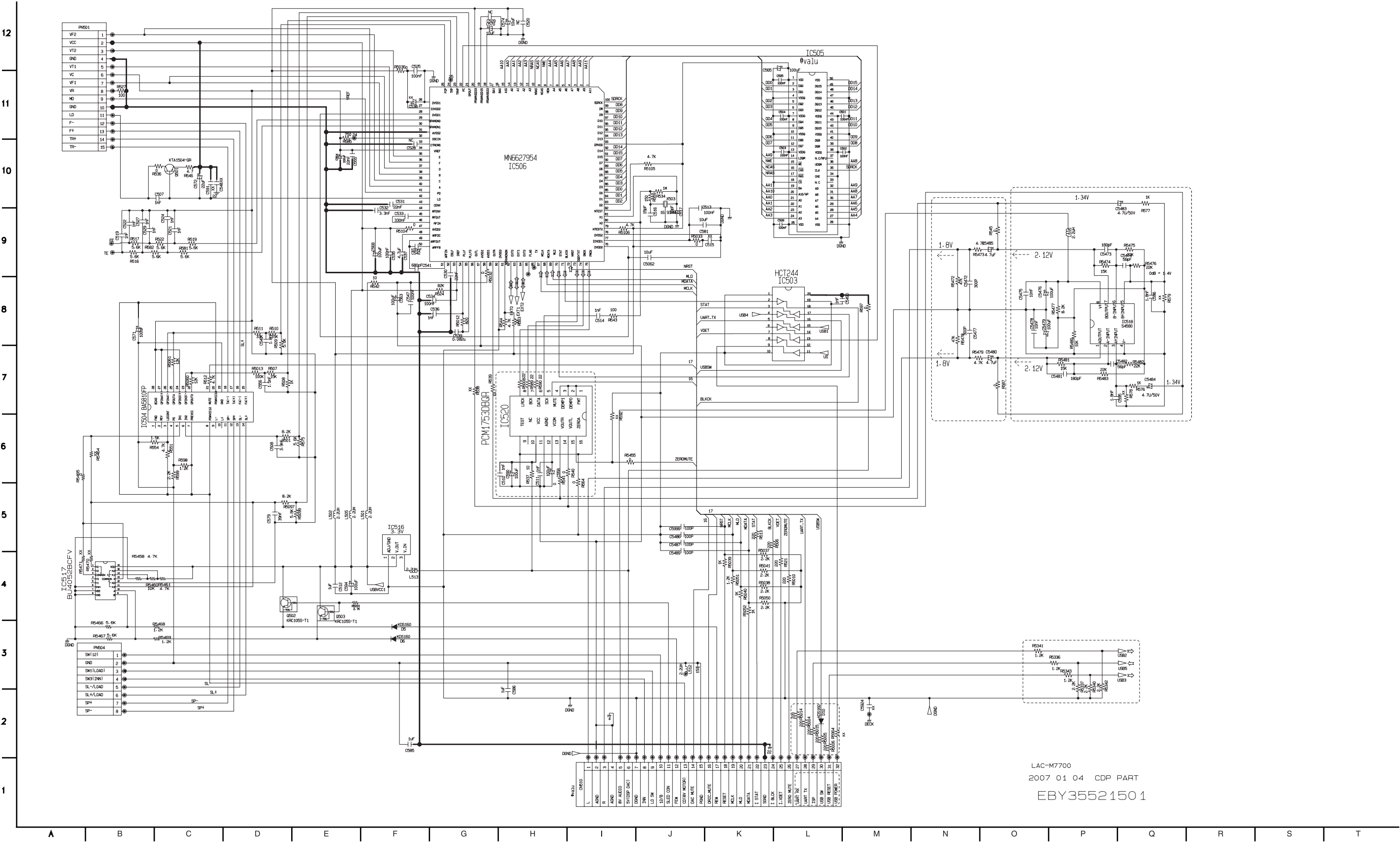


# CIRCUIT DIAGRAMS

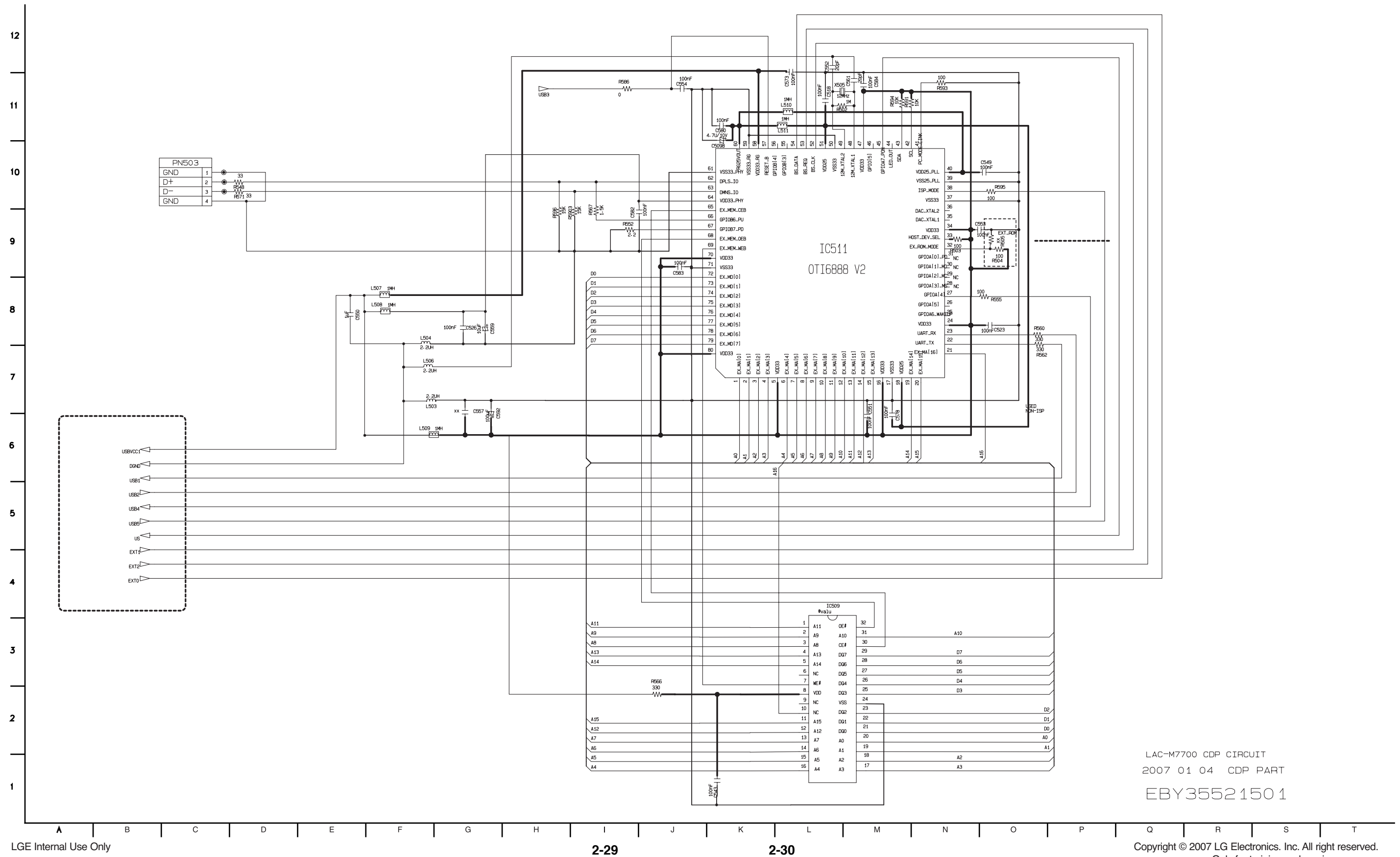
## 1. MAIN CIRCUIT DIAGRAM



2. CDP 1 CIRCUIT DIAGRAM



### 3. CDP 2 CIRCUIT DIAGRAM

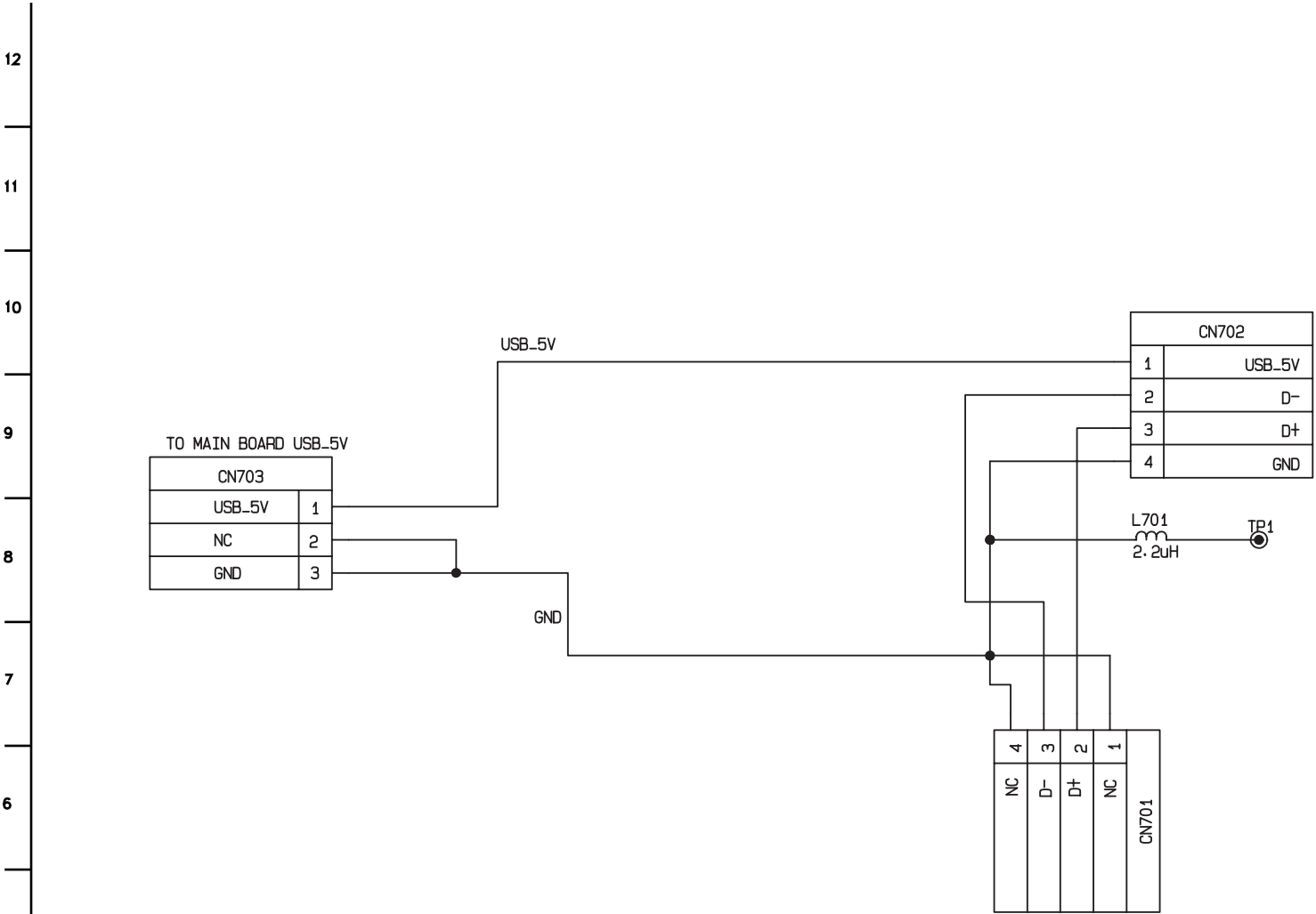


The schematic diagram illustrates the electrical connections for the LAC6700 front part. Key components and their connections include:

- PN901 Connector:** A 19-pin connector with signals: FRONT OPEN, GND, AUX L, AGND, AUX R, POWER 5V, LED B-4V, LCD B-4V, LCD RESET, LCD DO, KEY IN1, KEY IN2, VOL UP, VOL DOWN, REMOCON, LCD CE, LCD CLK, GND, and GND. It is connected to various LEDs and the LCD driver IC.
- LED PCB:** A WHITE LED PCB with two LEDs connected to R901 (220Ω) and R902 (220Ω) resistors, which are then connected to the LED B-4V and LCD B-4V pins of the PN901 connector.
- LCD Driver IC (IC901):** An LD3811 LCD DRIVER IC with multiple pins for COM (COMMON) and SEG (SEGMENT) signals. It is connected to the LCD panel and various resistors and capacitors for timing and signal conditioning.
- Resistors:** Various resistors are used throughout the circuit, including R940 (1.5K), R930 (100Ω), R931 (47Ω), R932 (4.7K), R933 (4.7K), R934 (4.7K), R935 (4.7K), R936 (680Ω), R937 (33K), R938 (2.2K), R939 (110Ω), R960 (110Ω), R961 (110Ω), R912 (330Ω), R971 (1.2K), R973 (3.3K), R941 (1.5K), R942 (1.5K), R943 (2.2K), R944 (2.2K), R945 (3.3K), R946 (4.7K), R947 (8.2K), R948 (15K), R949 (27K), R950 (1.2K), R951 (1.5K), R952 (2.2K), R953 (3.3K), R954 (4.7K), R955 (8.2K), R956 (15K), R957 (27K), R958 (47K), R959 (100K), R960 (200K), R961 (500K), R962 (1K), R963 (2K), R964 (5K), R965 (10K), R966 (20K), R967 (50K), R968 (100K), R969 (200K), R970 (500K), R971 (1K), R972 (2K), R973 (5K), R974 (10K), R975 (20K), R976 (50K), R977 (100K), R978 (200K), R979 (500K), R980 (1K), R981 (2K), R982 (5K), R983 (10K), R984 (20K), R985 (50K), R986 (100K), R987 (200K), R988 (500K), R989 (1K), R990 (2K), R991 (5K), R992 (10K), R993 (20K), R994 (50K), R995 (100K), R996 (200K), R997 (500K), R998 (1K), R999 (2K), R1000 (5K).
- Capacitors:** Various capacitors are used for timing and signal conditioning, including C901 (10nF), C902 (10nF), C903 (10nF), C904 (10nF), C905 (47nF), C906 (47nF), C907 (47nF), C908 (100nF), C909 (100nF), C910 (100nF), C911 (100nF), C912 (100nF), C913 (100nF), C914 (100nF), C915 (100nF), C916 (100nF), C917 (100nF), C918 (100nF), C919 (100nF), C920 (100nF), C921 (100nF), C922 (100nF), C923 (100nF), C924 (100nF), C925 (100nF), C926 (100nF), C927 (100nF), C928 (100nF), C929 (100nF), C930 (100nF), C931 (100nF), C932 (100nF), C933 (100nF), C934 (100nF), C935 (100nF), C936 (100nF), C937 (100nF), C938 (100nF), C939 (100nF), C940 (100nF), C941 (100nF), C942 (100nF), C943 (100nF), C944 (100nF), C945 (100nF), C946 (100nF), C947 (100nF), C948 (100nF), C949 (100nF), C950 (100nF), C951 (100nF), C952 (100nF), C953 (100nF), C954 (100nF), C955 (100nF), C956 (100nF), C957 (100nF), C958 (100nF), C959 (100nF), C960 (100nF), C961 (100nF), C962 (100nF), C963 (100nF), C964 (100nF), C965 (100nF), C966 (100nF), C967 (100nF), C968 (100nF), C969 (100nF), C970 (100nF), C971 (100nF), C972 (100nF), C973 (100nF), C974 (100nF), C975 (100nF), C976 (100nF), C977 (100nF), C978 (100nF), C979 (100nF), C980 (100nF), C981 (100nF), C982 (100nF), C983 (100nF), C984 (100nF), C985 (100nF), C986 (100nF), C987 (100nF), C988 (100nF), C989 (100nF), C990 (100nF), C991 (100nF), C992 (100nF), C993 (100nF), C994 (100nF), C995 (100nF), C996 (100nF), C997 (100nF), C998 (100nF), C999 (100nF), C1000 (100nF).
- Other Components:** A MATSUSHITA encoder (SW901) is connected to the KEY IN1 and KEY IN2 pins of the PN901 connector. A WON KWANG RM901 is connected to the LCD CLK pin of the PN901 connector. A ZD901 (K025 6V) is connected to the LCD CE pin of the PN901 connector. A ZD902 (K025 6V) is connected to the LCD CLK pin of the PN901 connector. A ZD903 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD904 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD905 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD906 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD907 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD908 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD909 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD910 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD911 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD912 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD913 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD914 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD915 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD916 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD917 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD918 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD919 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD920 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD921 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD922 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD923 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD924 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD925 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD926 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD927 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD928 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD929 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD930 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD931 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD932 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD933 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD934 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD935 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD936 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD937 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD938 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD939 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD940 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD941 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD942 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD943 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD944 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD945 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD946 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD947 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD948 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD949 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD950 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD951 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD952 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD953 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD954 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD955 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD956 (K025 6V) is connected to the LCD B-4V pin of the PN901 connector. A ZD957 (K025

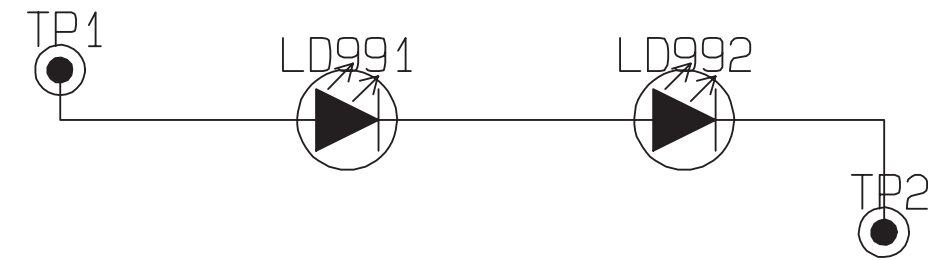
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5. USB CIRCUIT DIAGRAM



LAC6750R USB PART  
2006. 10. 27  
EBY3498490 1

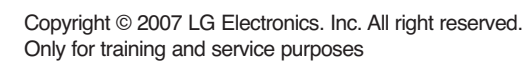
6. LCD LIGHTING CIRCUIT DIAGRAM



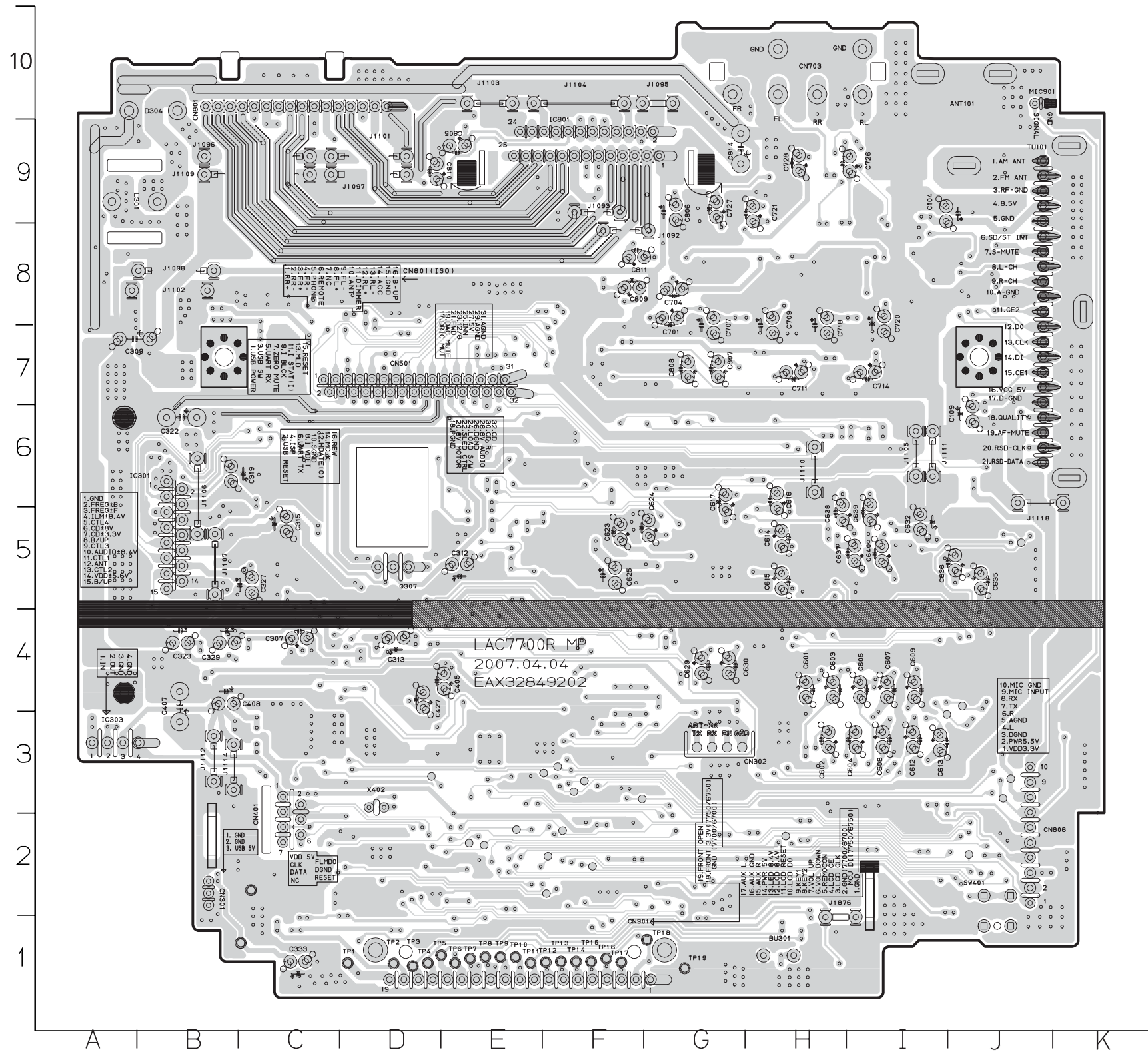
LAC7700R  
LCD LIGHTING  
SD0603662



## 1. MAIN P.C.BOARD (TOP VIEW)

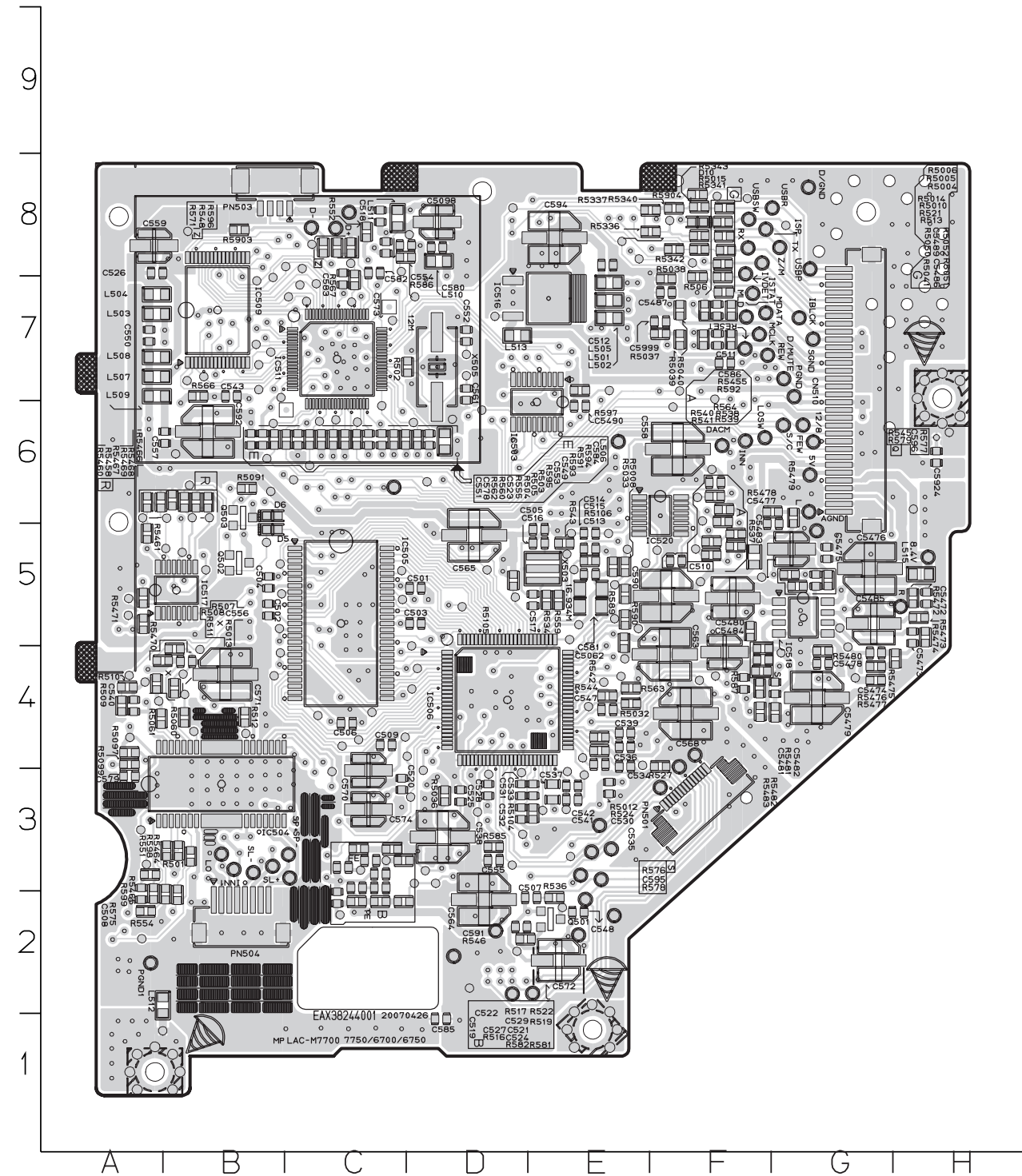


### MAIN P.C.BOARD (BOTTOM VIEW)

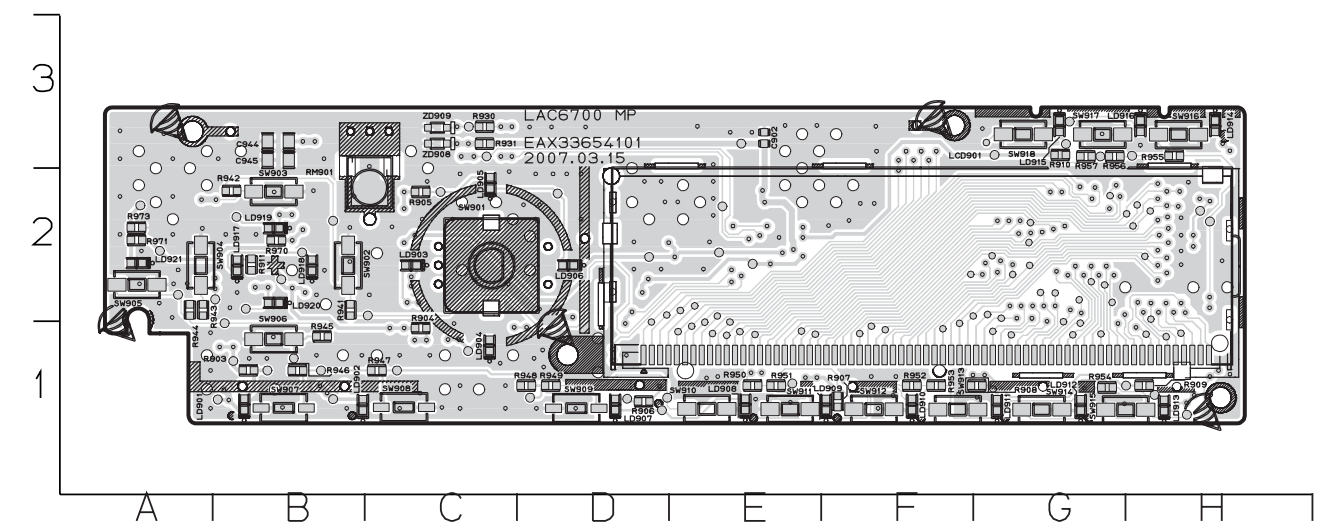




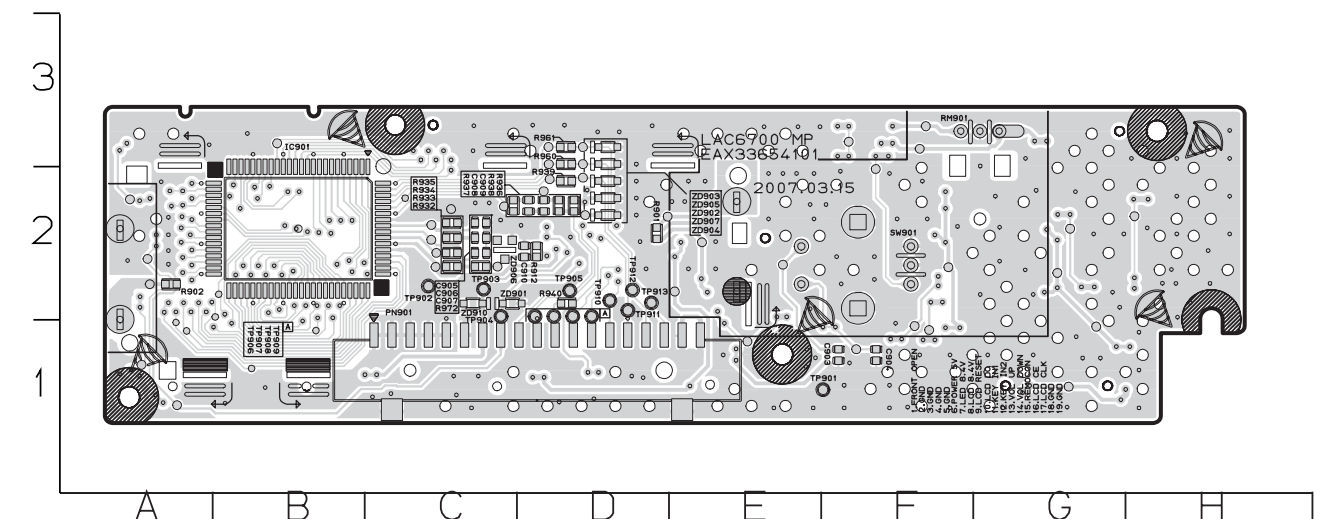
## 2. CDP P.C.BOARD



### 3. FRONT P.C.BOARD (TOP VIEW)

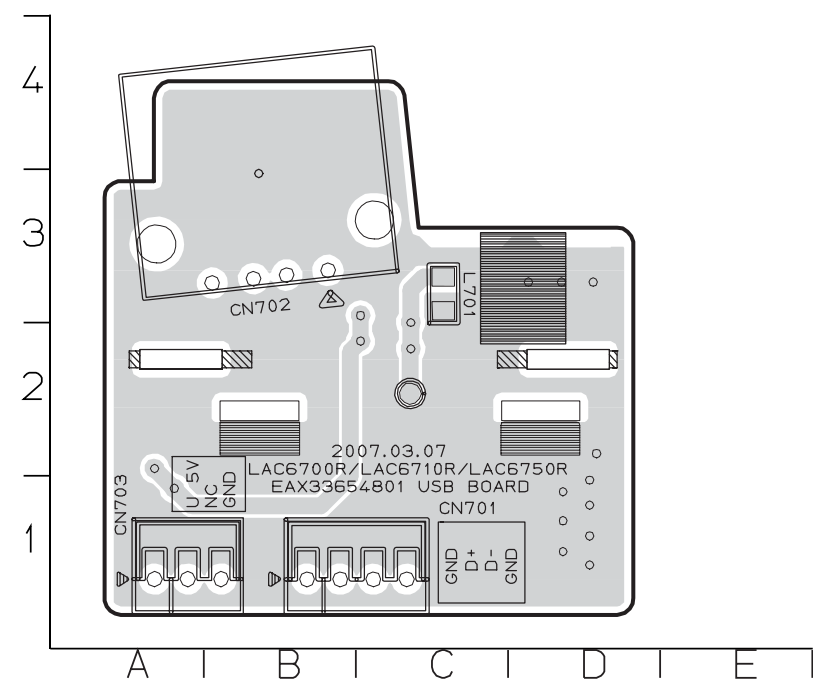


**(BOTTOM VIEW)**

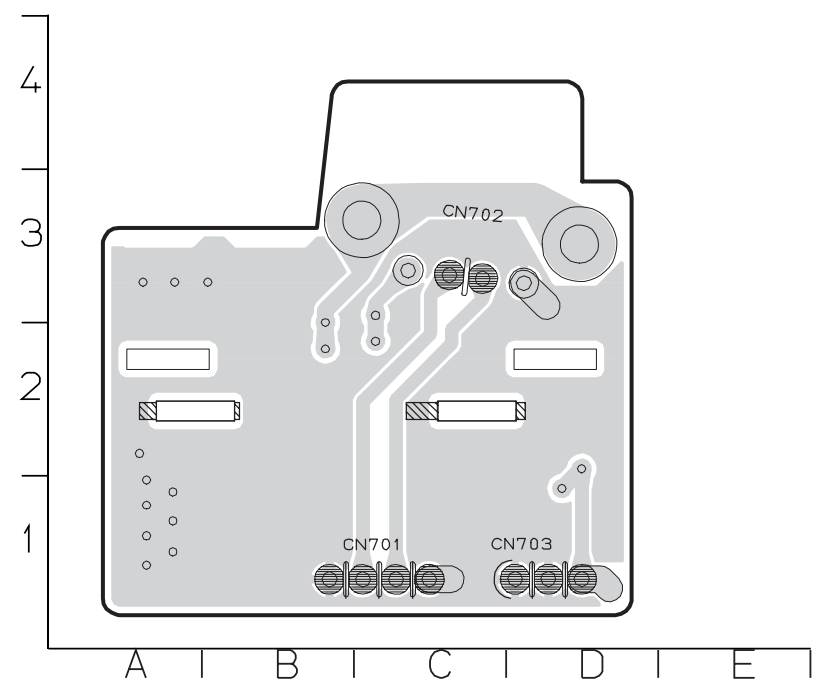




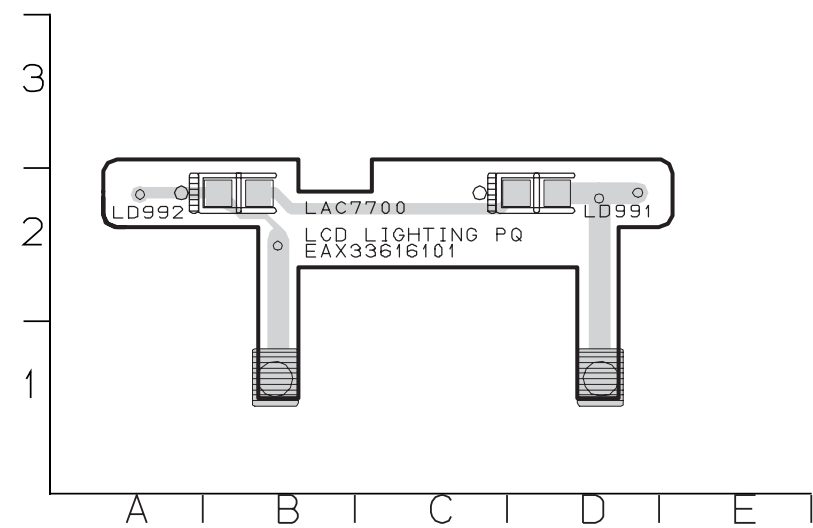
#### 4. USB P.C.BOARD (TOP VIEW)



#### (BOTTOM VIEW)

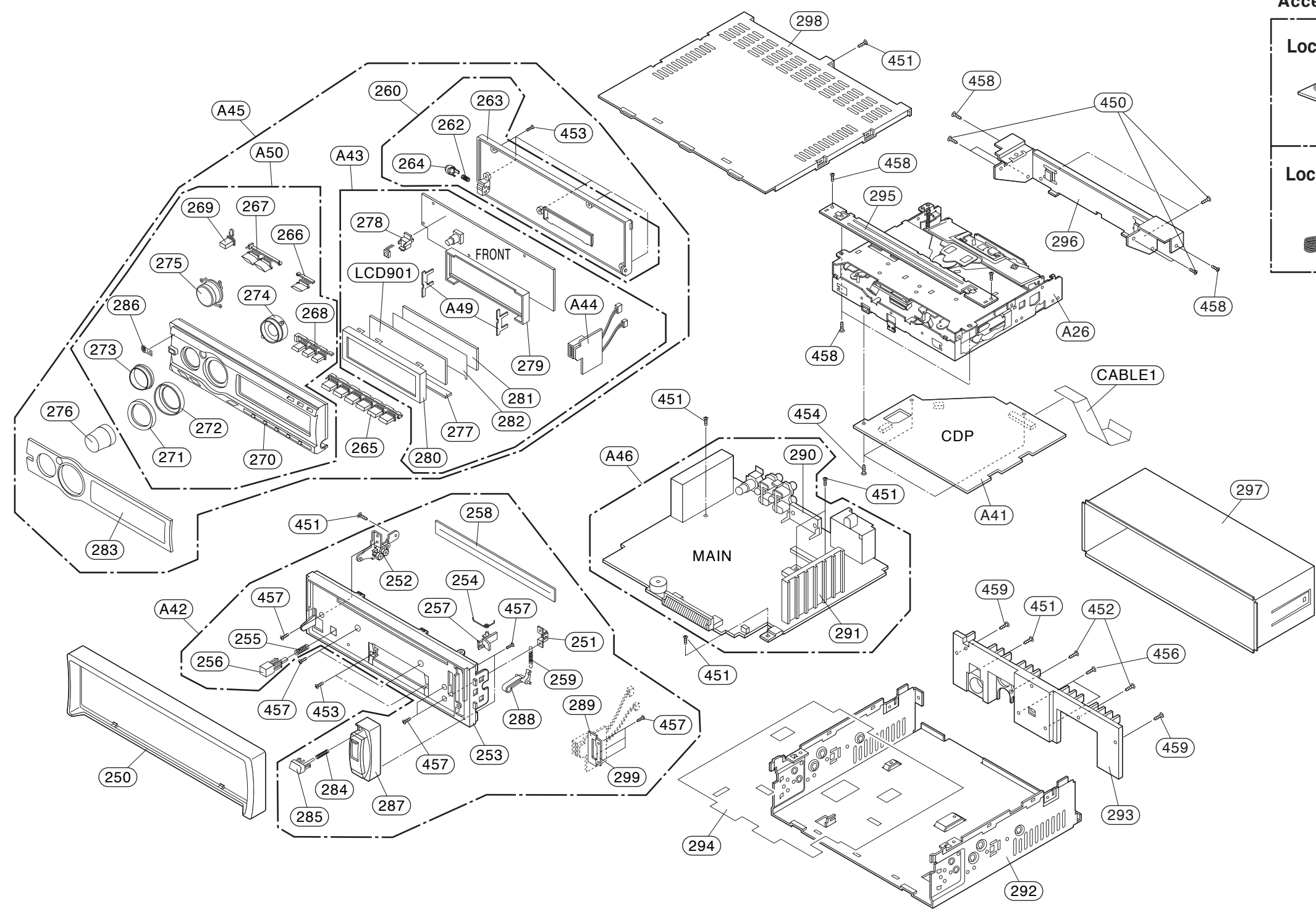


#### 5. LCD LIGHTING P.C.BOARD



# SECTION 3 EXPLODED VIEWS

## 1. CABINET AND MAIN FRAME SECTION



### \*Accessory

Loc.No. 801	Loc.No. 808	Loc.No. 818
Loc.No. 835	Loc.No. 850	Loc.No. 900

2. MECHANISM(PICK-UP) SECTION

